BELL TELEPHONE QUARTERLY

VOL. XIX APRIL, 1940 NO. 2

TOWARD A MORE PLEASING SERVICE

THE SIXTEENTH DECENNIAL CENSUS

MORE TELEPHONE BUILDINGS

THE TELEPHONE AS A SOCIAL FORCE

STANDARDIZING BUSINESS PAPERS

AMERICAN TELEPHONE & TELEGRAPH CO. • NEW YORK

BELL TELEPHONE QUARTERLY

A Medium of Suggestion and a Record of Progress

VOL. XIX APRIL, 1940 NO. 2

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SERVICE IN THE MIRROR

Within the gilt frame and against a black back-drop, faulty and pleasing actions, attitudes, and expressions of employees are "mirrored" to an audience here consisting of members of the Commercial, Plant, and Traffic Departments. The characters represented on stage in this picture are an installer and a housewife; the narrator, at the left, lays the scene for each incident. Employees throughout the country have taken part in similar "service skits," the objectives of which are described in the article beginning on the opposite page.

TOWARD A MORE PLEASING SERVICE

The Human Touch in Dealing with Customers, the Exercize of Judgment and Initiative in Unusual Situations, Help to Express the System's Attitude to the Public

By HAROLD M. PRESCOTT

THE ideal of a friendly, personal telephone service, as pleasing as it is efficient, has been a fundamental concept of Bell System operations for years.

As far back as 1922, President Thayer emphasized it by stating, "A really satisfactory service, besides being technically good, must include that intangible quality which we call the spirit of service pervading the whole personnel through all contacts with the public we serve."

President Gifford has similarly stressed and amplified the idea in frequent public statements, as well as in addresses to groups of Bell System executives and department heads. In his report to stockholders on Bell System operations for 1939 is the following reiteration of the concept: "In aiming to give the best possible telephone service, continued emphasis has been placed on the importance of such intangible but very real elements as courtesy, the spirit of helpfulness, the consideration of the needs of the individual subscriber and the use of initiative where regular practices are not adequate because of special circumstances."

Thus, the ideal has long been recognized; but the difficulty has been to define it practically to the great body of employees through whose attitudes and actions it must, in the final analysis, find expression. Only in the last few years has the ideal begun to mature fully, and it is the purpose of this article to outline the problem, and the methods by which this impressive change is being brought about.

It is difficult to define satisfactorily just what is meant when we speak of personalizing the service. One Bell Company has effectively consolidated the thoughts of many and expressed it thus:

"Courteous, businesslike, interested and natural treatment of customers in every contact with them."

"Willingness to grant reasonable requests even though they are not provided for in the rules and practices."

"Using routines and specifications as a guide to the handling of routine matters—not substituting them for judgment and common sense when unusual situations arise."

TYPICAL AUDIENCE

More than 125,000 telephone people, from all departments, attended "service skit" performances during 1939

"Breaking away from too close adherence to set practices and phrases when need develops."

"Being natural and pleasant in all dealings with people."

"Being patient, sympathetic, willing to listen, eager to understand and to help."

"Handling each contact with the customer in such a friendly manner that he will like the employee and the Company."

System Objectives and Program

SUCH a service, individually pleasing, cannot be brought about by written instructions and routines. It cannot be obtained by formula. It implies freedom to give expression to the natural tendency of all Bell System employees to be friendly and pleasant. It also implies certain limitations on the impulsive and indiscriminate use of judgment in all situations which might arise. Obviously, however, it cannot be limited by numerous restrictions without destroying the employee initiative and spontaneous action which are so necessary to its accomplishment. It can only be obtained by first developing in each employee a thorough understanding of the aims and objectives of the business.

Since each employee has the sincere desire to give such a service, his or her own judgment—in the light of that understanding—will then establish its own restrictions, suggest the occasions and opportunities, tell when to act, and how far to go. Some employees will visualize and understand the objectives more quickly than others. Not all will detect the same possibilities. But each will discover the means of expressing his or her own personality in the rendering of a more friendly and personal service.

All of the Bell System Companies have been and are now conducting

SPOTLIGHT ON PLEASING SERVICE

A friendly, interested attitude is demonstrated by (top to bottom) a repair service clerk, a supervisor and operator, an installer, and a business office representative

well planned programs for attaining the desired results. And throughout this effort one fact has been apparent —that leadership by executive management in this approach is of primary importance. Pleasing service will not just happen, any more than will high-grade technical results be attained, unless employees have a clear understanding of the objectives and how to reach them.

The acquainting of employees in all departments with a fundamental knowledge of Company aims and policies constitutes one of the more important activities. The better an employee understands his Company, the better he or she will be able to represent it to the public. The subjects covered in this educational program include Company organization, finances, working conditions, methods, practices, problems, service, operating results, and other significant matters.

The first step in such a program, logically, is the development of a proper understanding among the supervisory forces, who can then aid in reaching all employee levels with full and accurate information. Policies and objectives are discussed, questions asked and answered, and the reasons behind methods and practices are explained. This activity is then broadened to include employee information courses; employee infor-

Uncertain Abrupt Routine Irritated Customer

INDIFFERENT SERVICE

"Before and After Taking" might be the title for the story told by the facial expressions in the pictures above and on the opposite page

mation bulletins; group discussions with employees, either scheduled or informal; group meetings, pamphlets, and bulletins especially prepared for new employees; and casual, everyday, on-the-job encounters.

It is apparent that employees cannot be permitted to exercise judgment and freedom in dealing with customers until they have obtained a clear understanding of what constitutes good personalized service. Simply having the desire to render a pleasing and personal service is not enough. Activities directed specifically toward developing the right viewpoint include:

Increased emphasis in training programs on the principles of pleasing tone, voice, and manner.

Having groups of supervisory employees listen in simultaneously on operators' work, after which all members of the group discuss what has been heard, and reach a common understanding in regard to their individual appraisals of the service, tone, and manner.

Encouraging all levels of management to use every opportunity to observe the service, tone and manner, followed by a discussion with the force of what was observed.

Preparation and study of case examples of the handling of actual contacts between employees and customers. The tone and manner used by the employee in the handling of the case is compared with what might have been a more pleasing treatment of the situation.

Use of test cases in which a situation is presented, and the employees describe the best procedures, in their judgment, for dealing with the condition.

Employment of all contacts between supervisory force and employees in the day-to-day work for creating the proper viewpoint in regard to personalized service.

Analyses of service criticisms and customer attitude surveys.

AN activity aptly described as "Hear yourselves as others hear you" has been introduced in several Companies with beneficial results.

Confident Courteous Sparkling Pleased Customer

PLEASING SERVICE

In the Traffic Department application of this plan, each operating employee is permitted to listen in on other operators and appraise the service from the viewpoint of the customer. The observing is usually done in groups, and frequently with a supervisory employee also participating. Particular situations are pointed out and discussed as they occur. Further discussion is held after the listening period is concluded, so as to bring out how any undesirable occurrences could have been avoided and the service improved from the standpoint of the customer.

Suggestions are invited, and the employees are encouraged to adopt in their own work the principles developed during the listening and discussion. In subsequent discussions the employees are encouraged to relate how they have been able to apply to their own work what they learned by their listening-in experience. Criticisms of established practices are welcomed and, whenever practicable, modifications or changes are made and the employee concerned informed of this.

ATTENTION to the *principles* governing the determination of practices, rather than to the precise rules given in the practices, brings about such evidences of a desire to render a pleasing and personal service as the following:

All telephone dealings with customers are carried on in a friendly and natural manner, as if conversing face to face.

Suggested phrases are merely examples of a good way to express a thought concisely, and not rigid expressions to be memorized and repeated precisely. The attitude is direct and informal rather than impersonal and formally precise. For example, "I'm sorry" is more natural than "I am sorry" and "Do you know the number?" is more personal than "What is the number, please."

The words used are those which readily occur as the natural expression of thoughts in the interchange of ideas with the customer. The choice of words and manner are adapted to the individual customer and to the condition arising. For example, different words and manner of speaking are used in dealing with children than with adults. The

"I help provide your telephone service"
"My job of splicing cable is important because it is necessary to your telephone service. In the telephone business, there are many different jobs but all of us have the same aim — to do our work so that your service will be fast, dependable, low in cost and pleasing to you in every way."
Your Telephone Cable Splicer
You are cordially invited to visit the Bell System exhibit when you attend the New York and San Francisco World's Fairs.

TELLING OUR CUSTOMERS

Some of the Associated Bell Companies have used the theme of Pleasing Service as part of their regular newspaper advertising programs

wording of a statement is altered when repeating something that was not understood the first time it was spoken.

The use of routine or inappropriate phrases which do not quite apply is avoided: for example, the thoughtless use of "Thank you" to acknowledge a request such as "Will you see if the line is still busy?"

The natural tone and pitch characteristics of the voice are retained. Unnatural voice habits are avoided, such as mechanical voice tone, extreme rising inflection, exaggeratedly sweet tone, precise diction, and other voice mannerisms which may be distracting or displeasing to the customer.

Customers' wishes are conformed with whenever possible, so far as is consistent with the intent of the Company's objectives and the rights of any other customers who may be involved. Not infrequently it is found possible to give greater assistance than the customer expects.

The operator is attentive to the customer at all times and gives undivided attention to his call; unavoidable and long waits are explained; all remarks or orders are acknowledged; customers are addressed by name personally if the name is known; a friendly and pleasant response is made to all friendly greetings. Regret is expressed when something happens,

You have a personal representative in the telephone office

You may never meet her but she's there...the young woman who has at her fingertips a record of your telephone service. When you telephone our business office, she will handle any changes you want in your service, take care of your listings in the directory, and give you information you may want about your account.

She is eager to help you—to give you prompt, courteous, pleasing service. She seeks to do this with understanding—in the manner of a friend.

It takes telephone workers in many kinds of jobs to provide your telephone service. Wherever the job, they strive constantly to furnish service that meets your personal needs and is pleasing to you in every way.

* * *

NORTHWESTERN BELL TELEPHONE COMPANY

but mechanical and insincere expressions of regret are avoided. Excessive use of "I'm sorry," and the too frequent use of such expressions as "please" and "thank you," give the impression of studied formality rather than of friendly personal communication.

Undue haste or impatience is avoided, such as by talking in a hurried manner, breaking in to interrupt or to request a repetition before the customer has had time to finish what he has started to say, or trying to hurry him along when he hesitates or speaks slowly.

Employees are alert to recognize immediately and give individual attention to unusual situations, such as a call on which it appears that difficulty has been experienced, or where the customer's manner indicates that the call is urgent. Constant vigilance is kept for signs that indicate that the customer may be having difficulty, even though the trouble was not reported.

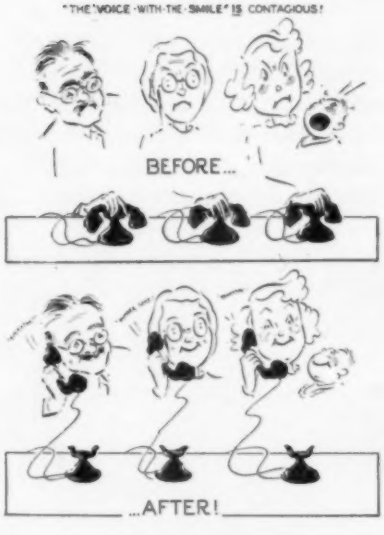
REMINDING OURSELVES

Examples of Pleasing Service are frequently noted in Associated Company employee publications—where these pictures of installer (above) and P.B.X. repairman (below) appeared

Dramatizing a Personalized Service

THE use of service skits, which dramatize the contrast between a technically good service and an equally good but personalized service, is one of the most effective means of demonstrating to the personnel some of the more important phases of friendly service. Interest is stimulated by encouraging as many employees as possible to participate.

While the service skit idea is not a recent one, it received new impetus at a meeting of the System vice presidents and general managers in 1937, where Plant and Sales skits were presented, and from a series of skits which was shown to the general traffic managers of the System in 1938.



Reminders

Posters are widely used. In almost all cases they represent the talent of employees—as do those above. The initials "C & P" at the right have added meaning for members of the Chesapeake and Potomac Telephone Company

C&P
MEANS
COMPLETE & PLEASING
Being ready and alert and in a friendly attitude of mind when the contact opens with all attention on the customer.

The leader in the Traffic skits introduced them with the following comment: "We will try to show you a variety of typical transactions with customers, based on actual experiences of local, toll or information operators. Each case will first appear in a way which shows the operator usually following her instructions, yet producing a neutral or negative impression on the customer and sometimes even failing to render desired, available service. Then, the same operator will handle the case again but in a way which leaves with the customer an impression of alertness and interest in his needs, and yields him a more satisfying service in every respect."

FOLLOWING this conference demonstration, the same cast presented the skits before officials and employees of many companies, and soon this "See yourself as others see you" idea was taken over and developed in all of the operating departments by the Associated Companies. It aroused tremendous interest among Commercial, Plant and Traffic employees. During 1939 more than 300 employee groups were formed to carry on this type of activity. More than 2000 employees participated in these "shows" and more than 125,000 people saw them. Not included in these figures are skits put on for the information of officials and employees of other telephone companies whose lines connect with those of Bell System companies.

In cities where dramatization of the skits by local employee casts is impractical, other methods of presenting them are used, thus extending the advantages of this important activity to even the smallest offices. Such methods include the recording of the skits on phonograph records; the reading and impromptu dramatization of the dialogue by two or more employees; the discussion of skit dialogue between unit supervisors, chief operators, and individual employees, with emphasis on the difference in the impressions of the service the customer would receive under the two types of handling.

Service skits illustrate the opportunities for personalizing the service which are to be found in everyday telephone transactions. Typical skits include a demonstration of friendly interested tone of voice; telephone habits and mannerisms; choice of words; repetitions and interruptions; impersonal, uninterested attitude; recognition of unusual circumstances and of opportunities to be helpful. They provide perhaps the best way of bringing vitality, understanding, and enthusiasm to the front in connection with continuing efforts for service betterment.

THE marked improvement in the technical phases of telephone service during the past ten years has left less room for improvements in this field than there has been in the past. While further technical advances will continue to be made, the greatest immediate opportunity for service betterment lies in the broad field of making the service more pleasing and more personal for the customer.

Vice President W. H. Harrison, of the A. T. and T. Company, has expressed the objective in these words: "More attentiveness, more courtesy,

more helpfulness—those personal touches which make the subscriber feel he is dealing with an individual and with an organization whose desire first and last is to serve his every request. It is not a challenge of leadership in technical proficiency; it is a challenge of stimulation, of inspiration to departmental leadership to create and sustain the will to do in this activity throughout every level of supervision."

When the men and women in the organization are satisfied that they are fully using these principles in their contacts with the public, then the Bell System as an organization will be giving a truly pleasing service.

THE SIXTEENTH DECENNIAL CENSUS

Some Observations, in Advance, on the Six Different Enumerations Which Comprise the Whole Undertaking and on the Usefulness of the Resultant Statistical Data to the Telephone Business

By ROBERT L. TOMBLEN

THIS is a census year. Some 12,000 enumerators started on January 2 to gather information with respect to the three million commercial firms, 170,000 manufacturing establishments, and approximately 12,000 mines and quarries in the country. This phase of the general census will take about five months to complete. During the month of April about 120,000 field workers will conduct an enumeration of a population estimated to have reached 131 million, a housing census to record the characteristics of about 33 million dwellings, and an agricultural census covering about seven million farms. Thus the sixteenth decennial census is actually six censuses combined into one major undertaking. This represents a gradual development of census procedure since the first enumeration of population 150 years ago.

The Constitution of the United States provides for an enumeration of the population every ten years for the purpose of apportioning Congressional representation and direct taxes. The only classification called for in the original authorization was a distinction between free persons and slaves. However, the number of heads of families was actually reported in 1790, so that even the first census exceeded the constitutional requirements slightly. Since then the population schedule has expanded far beyond its original scope.

In the preparation of the various census schedules, several thousand questions were suggested for inclusion by interested organizations and individuals. The final questionnaires evolved from a long series of conferences with experts in each field of inquiry and include the most significant and practical items, representing a very small fraction of the total proposals. Several new questions, designed to cover changed conditions since 1930, survived the elimination process. On the other hand, some of the questions included in the census schedules for past decades will be dropped this year as being no longer significant.

The complete census is expected to provide the factual background for a comprehensive statistical inventory of the nation's population, its living conditions, resources, and business activities. Much of this information should

have considerable value to business men, market analysts, statisticians, and the like.

The telephone industry has always made rather extensive use of census statistics in connection with market forecasts and measurements of sales results, and it is awaiting with interest the results of the 1940 census. But many persons, both inside and outside the telephone business, have little knowledge regarding the real nature and scope of the tremendous task of census taking, and few are informed concerning the factual data to be collected this year. Perhaps some of those who will have been questioned by the enumerator before this appears in print may feel that they have acquired more than an academic knowledge of the census as a result of their experience.

Difficulties Which are Inherent in Census Enumerations

WHILE the Census Bureau has grown rapidly, the country feels that it has always given full value for the money spent on its activities. It has operated efficiently, and has acquired a reputation for accuracy even beyond its own claims. When censuses have fallen short of a high standard, it has been because the Bureau was handicapped by factors beyond its control.

In several important respects—date of the census, scope of the questionnaires, and selection of supervisors and enumerators—the Census Bureau has perhaps made concessions at times to meet the desires of particular groups. Nevertheless, until the present time the Bureau has had a rather free hand in designing schedules; but serious question now is being raised in some quarters as to its constitutional right to ask for certain information.

There are other inevitable difficulties in census taking for which the Census Bureau cannot be held responsible. Instructions to enumerators and definitions of terms are subject to different interpretations; the phrasing of some questions may prove to be ambiguous or misunderstood; most interviews are with housewives, many of whom cannot give the requisite information; and last—but by no means least—is the difficulty introduced by certain queries which have been criticized as invading the privacy of the home and infringing on personal rights.

THERE is considerable opposition, for one reason or another, to questions relative to personal income, value of property, mortgage financing, and whether a woman has been married more than once. In cases where this resentful attitude is pronounced, it is possible that individuals may either deliberately misrepresent the facts in their responses or refuse to answer such questions. Any considerable amount of this type of reaction, if it should develop, would tend to cast doubt on the reliability and consequent usefulness of many tabulations. A census is no better than the information received, and its value depends upon the ability and willingness of the individual citizen to give full and accurate replies to all questions. No exact conclusions can be drawn from data of questionable validity.

A practical example of the difficulties encountered in attempting to collect field data arose in connection with the Real Property Inventories taken in many cities six or seven years ago. The replies received from householders indicated such a lack of information regarding property values and such a degree of misstatement with respect to these values that careful analysis showed the results in some cases to be questionable as a measure of true values.

This sixteenth decennial census is too complex and extensive to permit a complete description in a short review, but the principal phases of general interest will be briefly outlined.

The Census of Population

FOR the population census the 529 census districts have been subdivided into 147,000 enumeration districts, each containing some 1,500 persons or less. Usually there will be one enumerator for each district, except in certain regions where one will cover several districts. Incidentally, it is stated on each census form that enumerators are sworn to secrecy and that the data they collect can be used only for compiling statistical reports, and not for purposes of taxation, regulation, or investigation.

A reproduction of the population schedule appears opposite page 100. Perhaps the most fundamental innovation in it is the inclusion of a supplementary set of questions which will be asked of five per cent of the population. This sample is arbitrarily composed of the persons who appear on the fourteenth and twenty-ninth lines of each sheet of the schedule. Since, among other reasons, the majority of the extra queries apply to adults—principally wage earners and housewives—it seems doubtful if this random sampling will be representative of the population as a whole, and the results should be interpreted in the light of this situation.

In addition to the ordinary questions about age, sex, race, marital status, place of birth, relationship to head of household, size of family, and citizenship of the foreign-born, important new statistical information will also be accumulated on education, migration, employment status, and personal income. Some doubt has been expressed as to whether the data reported for the last item will provide an accurate picture of the situation with respect to income.

ONE of the most interesting of the new questions is that regarding the highest grade in school completed by each individual. Perhaps, as some people believe, the replies to this question will indicate the reasons for some of the pronounced differences in buying habits in different communities. Certainly it will have more significance than the former and now discarded question about literacy. Twenty years ago, six per cent of the population ten years of age and over could not read and write English, but it is believed that this ratio has now fallen to about two per cent, and will disappear rapidly as the older immigrants pass out of the population through death.

In this connection, it is of interest that the year of immigration of the foreign-born, quite important in the past, is now dropped. Immigration

in recent years has been negligible (indeed, between 1930 and 1940 there was a net outward migration) and consequently the foreign-born population is declining rapidly in numbers, the death rates of this class being high because of the advanced age of many of them. Conversely, the native-white population is becoming a much larger percentage of the total market than formerly, a condition which has always been regarded as favorable to telephone growth.

ANOTHER innovation on the population schedule is the special effort which is called for to insure that all infants will be reported. The purpose is to overcome the alleged tendency toward under-enumeration of very young children. The enumerator must inquire in each household if any babies were born to any member during the four months ending March 31, 1940. A special Infant Card must be filled out for each such child still living with the household, in addition to the entry made on the population schedule.

The Infant Card will have advantages beyond the improvement of the enumeration. Included in the information secured will be the place of birth. A check against the birth and infant death certificates will furnish an index of the completeness of birth registration, as well as of any possible under-enumeration of children under four months of age. In this connection it might be noted that the census population figures will provide a new base for computing current birth and death rates and will also facilitate the revision of yearly rates from 1930 to date.

Aside from the one exception just mentioned, the very useful enumeration by ages will remain unchanged. The results will be interesting to study because the changing age composition of the population is an important factor in market considerations. As a result of the lower birth rates of the past decade, the adults now form a larger proportion of the total population than in 1930. This in turn has resulted in a relatively faster growth in the number of families than in population during this ten-year period, a development favorable to the telephone industry since the family represents the basic unit of residential telephone use.

A new approach has been made to the collection of data on employment and unemployment. For the first time, information will be obtained on the economic activity of every person 14 or more years of age for a definite period (the week of March 24–30). The census schedule distinguishes between workers in private occupations or permanent Government occupations and those in public emergency or temporary work, such as relief projects. Persons seeking work will be divided between those with previous work experience and new workers. Persons not in the labor force will be classified as engaged in home housework, in school, unable to work, or "other."

The number of hours worked will be reported for persons at work during the last week in March, and the duration of unemployment will be stated for those seeking work and for emergency workers. For persons employed during the specified week, or those with a job or a business, ques-

Your report is required by Act of Congress. This Act makes it unlawful for t
collected will be used solely for preparing statistical information concerning t

DEPARTM

SIXTEENTH

P

State _____ Incorporated place _____ Ward of city _____ Unincorporated place _____
(Name of unincorporated place having 100 or more inhabitants)

County _____ Township or other division of county _____ Block Nos. _____ Institution _____
(Name of institution and lines on which entries are made)

U. S. GOVERNMENT PRINTING OFFICE 16—11570

Line No.	LOCATION: Street, avenue, road, etc.	LOCATION: House number (in cities and towns)	HOUSEHOLD DATA: Number of household in order of visitation	HOUSEHOLD DATA: Home owned (O) or rented (R)	HOUSEHOLD DATA: Value of home, if owned, or monthly rental, if rented	HOUSEHOLD DATA: Does this household live on a farm? (Yes or No)	NAME: Name of each person whose *usual place of residence* on April 1, 1940, was in this household. BE SURE TO INCLUDE: 1. Persons temporarily absent from household. Write "Ab" after names of such persons. 2. Children under 1 year of age. Write "Infant" if child has not been given a first name. Enter ⊗ after name of person furnishing information.	RELATION: Relationship of this person to the head of the household, as wife, daughter, father, mother-in-law, grandson, lodger, lodger's wife, servant, hired hand, etc.	RELATION: CODE (Leave blank)	PERSONAL DESCRIPTION: Sex—Male (M), Female (F)	PERSONAL DESCRIPTION: Color or race	PERSONAL DESCRIPTION: Age at last birthday	PERSONAL DESCRIPTION: Marital status—Single (S), Married (M), Widowed (Wd), Divorced (D)	EDUCATION: Attended school or college any time since March 1, 1940? (Yes or No)	EDUCATION: Highest grade of school completed	EDUCATION: CODE (Leave blank)	PLACE OF BIRTH: If born in the United States, give State, Territory, or possession. If foreign born, give country in which birthplace was situated on January 1, 1937. Distinguish Canada-French from Canada-English and Irish Free State (Eire) from Northern Ireland.	PLACE OF BIRTH: CODE (Leave blank)	CITIZENSHIP: Citizenship of the foreign born	RESIDENCE, APRIL 1, 1935: IN WHAT PLACE DID THIS PERSON LIVE ON APRIL 1, 1935? For a person who, on April 1, 1935, was living in the same house as at present, see Col. 17 "Same house," and for one living in a different house but in the same town, enter, "Same place," leaving Cols. 18, 19, and 20 blank, in both instances. For a person who lived in a different place, enter city or town, county, and State directed in the Instructions. (Enter actual place of residence, which may differ from mail address.)	RESIDENCE, APRIL 1, 1935: COUNTY	RESIDENCE, APRIL 1, 1935: STATE (or Territory or foreign country)	RESIDENCE, APRIL 1, 1935: On a farm? (Yes or No)	CODE
	1	2	3	4	5	6		8	A	9	10	11	12	13	14	B	15	C	16	17	18	19	20	
1																				City, town, or village having 2,500 or more inhabitants. Enter "R" for all other places.				
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
39																								
40																								

SUPPLEMENTARY QUESTIONS

For Persons Enumerated on Lines 14 and 29

FOR PERSONS OF ALL AGES

Line No.	NAME	PLACE OF BIRTH OF FATHER AND MOTHER: If born in the United States, give State, Territory, or possession. If foreign born, give country in which birthplace was situated on January 1, 1937. Distinguish Canada-French from Canada-English and Irish Free State (Eire) from Northern Ireland: FATHER	MOTHER	CODE (Leave blank)	MOTHER TONGUE (OR NATIVE LANGUAGE): Language spoken in home in earliest childhood	CODE (Leave blank)	VETERANS: Is this person a veteran of the United States military forces; or the wife, widow, or under-18-year-old child of a veteran? If "Yes," enter "Yes"	If child, is veteran father dead? (Yes or No)	War or military service	CODE (Leave blank)	FOR PERSONS 14 YEARS OLD AND OVER: SOCIAL SECURITY: Does this person have a Federal Social Security Number? (Yes or No)	Were deductions for Federal Old-Age Insurance Tax (1%) actually made from this person's wages or salary in 1939? (Yes or No)	If so, were deductions made from (1) all, (2) more than one-half, or (3) one-half or less than one-half of wages or salary?	USUAL OCCUPATION, INDUSTRY, AND CLASS OF WORKER: Enter that occupation which the person regards as his usual occupation, that is, the one at which he is able to work. If the person is unable to determine this, enter the occupation at which he worked longest during the past 10 years and at which he is physically able to work. For a person without previous work experience, enter "None." Be sure to state industry and usual class of worker. For a person without previous work experience, enter "None." Be sure to state industry and usual class of worker.	USUAL OCCUPATION	USUAL INDUSTRY
	35	36	37	G	38	H	39	40	41	I	42	43	44	45	46
14															
29															

Your report is required by Act of Congress. This Act makes it unlawful for the Bureau to disclose any facts, including names or identity, from
collected will be used solely for preparing statistical information concerning the Nation's population, resources, and business activities. Your

DEPARTMENT OF COMMERCE—BUREAU OF

Unincorporated place .....
(Name of unincorporated place having 100 or more inhabitants)

SIXTEENTH CENSUS OF THE UNITE

Institution .....
(Name of institution and lines on which entries are made)

POPULATION SCHED

ON	PLACE OF BIRTH		CITI-ZEN-SHIP	RESIDENCE, APRIL 1, 1935												
CODE (Leave blank)	If born in the United States, give State, Territory, or possession. If foreign born, give country in which birthplace was situated on January 1, 1937. Distinguish Canada-French from Canada-English and Irish Free State (Eire) from Northern Ireland.	CODE (Leave blank)	Citizenship of the foreign born	IN WHAT PLACE DID THIS PERSON LIVE ON APRIL 1, 1935? For a person who, on April 1, 1935, was living in the same house as at present, enter in Col. 17 "Same house," and for one living in a different house but in the same city or town, enter, "Same place," leaving Cols. 18, 19, and 20 blank, in both instances. For a person who lived in a different place, enter city or town, county, and State, as directed in the Instructions. (Enter actual place of residence, which may differ from mail address.)					Was this person AT WORK for pay or profit in private or nonemergency govt. work during week of March 24–30? (Yes or No)	If not, was he HAVING A JOB but not at WORK (SPA, NYA, CCC, etc.) during week of March 24–30? (Yes or No)	If neither at work nor assigned to public emergency work ("No" in Cols. 21 and 22)		For persons answering "No" to quest. 21, 22, 23, and 24		If priv none gency work ("Yes" Col.
				City, town, or village having 2,500 or more inhabitants. Enter "R" for all other places.	COUNTY	STATE (or Territory or foreign country)	On a farm? (Yes or No)	CODE (Leave blank)			Was this person SEEKING WORK? (Yes or No)	If not seeking work, did he HAVE A JOB, business, etc.? (Yes or No)	Indicate whether engaged in home housework (H), in school (S), unable to work (U), or other (O)?	CODE	Number of hours worked during
B	15	C	16	17	18	19	20	D	21	22	23	24	25	E	2

mes or identity, from your census reports. Only sworn census employees will see your statements. Data ness activities. Your Census Reports Cannot Be Used for Purposes of Taxation, Regulation, or Investigation.

16-232

BUREAU OF THE CENSUS

E UNITED STATES: 1940

SCHEDULE

S. D. No. ..... E. D. No. .....

Sheet N .

.....A

Enumerated by me on ....., 1940.

....., *Enumerator.*

PERSONS 14 YEARS OLD AND OVER—EMPLOYMENT STATUS

For persons answering "No" in quest. 21, 23, 25, and 24 — Indicate whether engaged in home housework (H); in school (S); unable to work (U); or other (O) — CODE	If at private or nonemergency Government work. ("Yes" in Col. 21) — Number of hours worked during week of March 24–30, 1940	If seeking work or assigned to public emergency work. ("Yes" in Col. 22 or 23) — Duration of unemployment up to March 30, 1940—in weeks	OCCUPATION, INDUSTRY, AND CLASS OF WORKER. For a person *at work, assigned to public emergency work, or with a job* ("Yes" in Col. 21, 22, or 24), enter *present occupation*, industry, and class of worker. For a person *seeking work* ("No" in Col. 23): (a) If he has previous work experience, enter *last occupation*, industry, and class of worker; or (b) If he does not have previous work experience, enter "New worker" in Col. 28, and leave Cols. 29 and 30 blank. — OCCUPATION: Trade, profession, or particular kind of work, as—*frame spinner, salesman, laborer, rivet heater, music teacher*	INDUSTRY: Industry or business, as—*cotton mill, retail grocery, farm, shipyard, public school*	Class of worker	CODE (Leave blank)	Number of weeks worked in 1939 (Exclusive full-time weeks)	INCOME IN 1939 (12 months ending December 31, 1939): Amount of money wages or salary received (Including commissions)	Did this person receive income of $50 or more from sources other than money wages or salary? (Yes or No)	Number of Farm Schedule	Line No.
25	26	27	28	29	30	F	31	32	33	34	
											1
											2
											3
											4
											5
											6
											7
											8
											9
											10
											11
											12
											13
											14
											15
											39
											40

FOR ALL WOMEN WHO ARE OR HAVE BEEN MARRIED: Has this woman been married more than once? (Yes or No)	Age at first marriage	Number of children ever born (Do not include stillbirths)	FOR OFFICE USE ONLY—DO NOT WRITE IN THESE COLUMNS: Ten (4)	V-R (5)	Fm. res. and Sex (6 and 9)	Color and nat. (10, 15, 36, and 37)	Age (11)	Mar. st. (13)	Gr. com. (30)	Ch. (16)	Wrk. st. (35)	Hrs. wkd. or Dur. un. (38 or 97)	Occupation, industry, and class of worker (U)	Wks. wkd. (31)	Wages (32)	Ot. inc. (33)			Line No.
48	49	50	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
																			14
																			29

State ..... Incorporated place ..... Ward of city .....

County ..... Township or other division of county ..... Unincorporated plac

SECTION

I. LOCATION AND HOUSEHOLD DATA

II. CHARACTE

	1	2	3	4	5	6	7	8
	No. of structure in order of visitation		Color or race of head	Number of persons in household	Live on a farm?	Home tenure	Value of home or monthly rental	Type of structure in which this dwelling unit is located
1	Dwelling unit No. within structure	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	White ☐1 Negro ☐2 All other ☐3		Yes ☐1 No ☐0	Owned ☐0 Rented ☐1	$..... Est. rent of owned nonfarm home $.....	Structure without business: 1-family detached ☐V; 1-family attached ☐0; 2-family side-by-side ☐1; 2-family other ☐2 2- or more fam. struct. without bus. ..... Struct. with business ..... Other dwelling place.....
2	Struct. No. Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
3	Struct. No. Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
4	Struct. No. Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
5	Struct. No. Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
6	Struct. No Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
7	Struct. No. Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
8	Struct. No. Dwelling unit No.	Population Line No. ..... Block No. ..... Name of head ..... Street and No. ..... Apt. No. or location	Color White ☐1 Negro ☐2 All other ☐3	Number of persons	On a farm? Yes ☐1 No ☐0	Tenure Owned ☐0 Rented ☐1	Value or rent $..... Est. rent owned nonfarm $.....	Type of structure Structure without business: 1-fam. detach ☐V; 1-fam. attach ☐0; 2-fam. s-by-s ☐1; 2-fam. other ☐2 3-or-more no bus. ..... With bus. ..... Oth. dwlg. place.....
9	Struct. No. Dwelling	Population Line No. ..... Block No. ..... Name of head	Color White ☐1 Negro	Number of persons	On a farm? Yes	Tenure Owned ☐0	Value or rent $.....	Type of structure Structure without business: 1-fam. detach ☐V 3-or-more no bus.

Your report is required by Act of Congress. This Act makes it unlawful for the Bureau to disclose any facts, including names or identity, from your census reports. O
collected will be used solely for preparing statistical information concerning the Nation's population, resources, and business activities. Your Census Reports Cannot Be U

d of city .....

ncorporated place .....
(Name of unincorporated place having 100 or more inhabitants)

DEPARTMENT OF COMMERCE—BUREAU OF TH

SIXTEENTH CENSUS OF THE UNITED STATE

OCCUPIED-DWELLING SCHE

(To be used for dwelling units occupied by households enumerated on the P

CHARACTERISTICS OF STRUCTURE

III. CHARACTERISTICS OF DWELLING UNIT

8	9	10	11	12	13	14	15	16	17	18	19	20	
ructure in which ng unit is located h- No. of units V 1-or-more fam. struct. without bus. 0 1 Struct. with business 2 Other dwelling place	Originally built as: Resid. struct. same no. dwlg. units 1 Resid. struct. differ. no. dwlg. units 2 Nonresid. struct. 3	Exterior material Wood 1 Brick 2 Stone 3 Other 4	Structure in need of major repairs? Yes 1 No 0	Year originally built A	Number of rooms B	Water supply Running water in dwelling unit 1 Hand pump in dwelling unit 2 Running water within 50 ft. 3 Other supply within 50 ft. 4 No water supply within 50 ft. 5	Toilet facilities Flush toilet in str., excl. use 1 Flush toilet in str., shared 2 Nonflush toilet in structure 3 Outside toilet or privy 4 No toilet or privy 5	Bathtub or shower with running water in structure Exclusive use 1 Shared 2 None 3	Principal lighting equip't Electric 1 Gas 2 Kerosene, gasol. 3 Other 4	Principal refrigeration equip't Mechanical 1 Ice 2 Other 3 None 4	Radio in dwelling unit? Yes 1 No 0	Heating equipment Steam or hot water system 1 Piped warm air system 2 Pipeless warm air furnace 3 Heating stove 4 Other or none 5	P use Coal or coke Wood Gas Electric
of structure h- No. of units V 3-or-more no bus. 0 1 With bus 2 Oth. dwlg. place	Built as: Residential same 1 Residential differ 2 Nonresidential 3	Exterior Wood 1 Brick 2 Stone 3 Other 4	Major repairs? Yes 1 No 0	Year built A	Rooms B	Water Run. wat. in. 1 Hd. pump in. 2 Run. wat. 50ft. 3 Other 50 ft. 4 None 50 ft. 5	Toilet Fl., in, excl. 1 Fl., in, shar. 2 Nonfl., in 3 Outside 4 None 5	Bath Excl. use 1 Shared 2 None 3	Light Elec. 1 Gas 2 Ker., gasol. 3 Other 4	Refrig. Mech. 1 Ice 2 Other 3 None 4	Radio Yes 1 No 0	Heating equip't Steam or hot water 1 Piped warm air 2 Pipeless warm air 3 Heating stove 4 Other or none 5	H Coal or coke Wood Gas Elec.
of structure h- No. of units V 3-or-more no bus. 0 1 With bus 2 Oth. dwlg. place	Built as: Residential same 1 Residential differ 2 Nonresidential 3	Exterior Wood 1 Brick 2 Stone 3 Other 4	Major repairs? Yes 1 No 0	Year built A	Rooms B	Water Run. wat. in. 1 Hd. pump in. 2 Run. wat. 50ft. 3 Other 50 ft. 4 None 50 ft. 5	Toilet Fl., in, excl. 1 Fl., in, shar. 2 Nonfl., in 3 Outside 4 None 5	Bath Excl. use 1 Shared 2 None 3	Light Elec. 1 Gas 2 Ker., gasol. 3 Other 4	Refrig. Mech. 1 Ice 2 Other 3 None 4	Radio Yes 1 No 0	Heating equip't Steam or hot water 1 Piped warm air 2 Pipeless warm air 3 Heating stove 4 Other or none 5	H Coal or coke Wood Gas Elec.
of structure h- No. of units V 3-or-more no bus. 0 1 With bus 2 Oth. dwlg. place	Built as: Residential same 1 Residential differ 2 Nonresidential 3	Exterior Wood 1 Brick 2 Stone 3 Other 4	Major repairs? Yes 1 No 0	Year built A	Rooms B	Water Run. wat. in. 1 Hd. pump in. 2 Run. wat. 50ft. 3 Other 50 ft. 4 None 50 ft. 5	Toilet Fl., in, excl. 1 Fl., in, shar. 2 Nonfl., in 3 Outside 4 None 5	Bath Excl. use 1 Shared 2 None 3	Light Elec. 1 Gas 2 Ker., gasol. 3 Other 4	Refrig. Mech. 1 Ice 2 Other 3 None 4	Radio Yes 1 No 0	Heating equip't Steam or hot water 1 Piped warm air 2 Pipeless warm air 3 Heating stove 4 Other or none 5	H Coal or coke Wood Gas Elec.
of structure h- No. of units V 3-or-more no bus. 0 1 With bus 2 Oth. dwlg. place	Built as: Residential same 1 Residential differ 2 Nonresidential 3	Exterior Wood 1 Brick 2 Stone 3 Other 4	Major repairs? Yes 1 No 0	Year built A	Rooms B	Water Run. wat. in. 1 Hd. pump in. 2 Run. wat. 50ft. 3 Other 50 ft. 4 None 50 ft. 5	Toilet Fl., in, excl. 1 Fl., in, shar. 2 Nonfl., in 3 Outside 4 None 5	Bath Excl. use 1 Shared 2 None 3	Light Elec. 1 Gas 2 Ker., gasol. 3 Other 4	Refrig. Mech. 1 Ice 2 Other 3 None 4	Radio Yes 1 No 0	Heating equip't Steam or hot water 1 Piped warm air 2 Pipeless warm air 3 Heating stove 4 Other or none 5	H Coal or coke Wood Gas Elec.
of structure h- No. of units V 3-or-more no bus. 0 1 With bus 2 Oth. dwlg. place	Built as: Residential same 1 Residential differ 2 Nonresidential 3	Exterior Wood 1 Brick 2 Stone 3 Other 4	Major repairs? Yes 1 No 0	Year built A	Rooms B	Water Run. wat. in. 1 Hd. pump in. 2 Run. wat. 50ft. 3 Other 50 ft. 4 None 50 ft. 5	Toilet Fl., in, excl. 1 Fl., in, shar. 2 Nonfl., in 3 Outside 4 None 5	Bath Excl. use 1 Shared 2 None 3	Light Elec. 1 Gas 2 Ker., gasol. 3 Other 4	Refrig. Mech. 1 Ice 2 Other 3 None 4	Radio Yes 1 No 0	Heating equip't Steam or hot water 1 Piped warm air 2 Pipeless warm air 3 Heating stove 4 Other or none 5	H Coal or coke Wood Gas Elec.
of structure h- No. of units V 3-or-more no bus. 0	Built as: Residential same 1	Exterior Wood 1 Brick 2	Major repairs? Yes	Year built	Rooms	Water Run. wat. in. 1 Hd. pump in. 3	Toilet Fl., in, excl. 1 Fl., in, shar. 2	Bath Excl. use 1	Light Elec. 1 Gas 2	Refrig. Mech. 1 Ice 2	Radio Yes 1	Heating equip't Steam or hot water 1 Piped warm air	H Coal

...ses. This Act makes it unlawful for the Bureau to disclose any facts, including names or identity, from your census reports. Only sworn census employees will see your statements. Data ...statistical information concerning the Nation's population, resources, and business activities. Your Census Reports Cannot Be Used for Purposes of Taxation, Regulation, or Investigation.

16—254

DEPARTMENT OF COMMERCE—BUREAU OF THE CENSUS

SIXTEENTH CENSUS OF THE UNITED STATES: 1940—HOUSING

OCCUPIED-DWELLING SCHEDULE

(To be used for dwelling units occupied by households enumerated on the Population Schedule)

S. D. No. ..... E. D. No. .....

SHEET NO. ....A

Enumerated by me on ....., 1940.

....., Enumerator

III. CHARACTERISTICS OF DWELLING UNIT

14	15	16	17	18	19	20	21	22
Water supply	**Toilet facilities**	**Bathtub or shower with running water in structure**	**Principal lighting equip't**	**Principal refrigeration equip't**	**Radio in dwelling unit?**	**Heating equipment**	**Principal fuel used for heating**	**Principal fuel used for cooking**
Running water in dwelling unit ☐1 Hand pump in dwelling unit ☐2 Running water within 50 ft. ☐3 Other supply within 50 ft. ☐4 No water supply within 50 ft. ☐5	Flush toilet in str., excl. use ☐1 Flush toilet in str., shared ☐2 Nonflush toilet in structure ☐3 Outside toilet or privy ☐4 No toilet or privy ☐5	Exclusive use ☐1 Shared ☐2 None ☐3	Electric ☐1 Gas ☐2 Kerosene, gasoline ☐3 Other ☐4	Mechanical ☐1 Ice ☐2 Other ☐3 None ☐4	Yes ☐1 No ☐0	Steam or hot water system ☐1 Piped warm air system ☐2 Pipeless warm air furnace ☐3 Heating stove ☐4 Other or none ☐5	Coal or coke ☐1 Fuel oil ☐5 Wood ☐2 Kerosene or gasoline ☐6 Gas ☐3 Other ☐7 Electricity ☐4 None ☐8	Coal or coke ☐1 Kerosene or gasoline ☐6 Wood ☐2 Other ☐7 Gas ☐3 None ☐8 Electricity ☐4 C

IV. UTILITY DATA FOR EACH RENTER-OCCUPIED NONFARM UNIT

23	24
Furniture incl. in rent?	**Average monthly cost of—**
Yes ☐1 No ☐0	Electricity $..... Gas $..... Other fuel $..... Water ? .....
Est. rent without furniture	
$.....	

V. FINANCIAL DATA FOR EACH OWNER-OCCUPIED NONFARM UNIT

(In structure without business containing not more than 4 dwelling units)

25	26	FOR EACH FIRST MORTGAGE OR LAND CONTRACT				
		27	28	29	30	31
Value of property	**Mortgage on property**	**Regular payments required**	**Do payments include an amount for reduction of principal?**	**Do payments include real estate taxes?**	**Interest rate now chg'd**	**Holder of first mortgage (or land contract)**
$..... No. of dwlg. units D	Yes ☐1 No ☐0 Present debt On 1st mtg. $..... On 2d mtg. $.....	Monthly ☐1 Quarterly ☐2 Semiannual ☐3 Annual ☐4 Other reg. part. plan ☐5 No reg. part. required ☐6 Amount of each pmt. $.....	Yes ☐1 No ☐0	Yes ☐1 No ☐0	....% E	Bldg. & Loan ☐1 Com. Bank ☐2 Savings Bank ☐3 Life insur. Co. ☐4 Mtg. Co. ☐5 HOLC ☐6 Individual ☐7 Other ☐8

Water	Toilet	Bath	Light	Refrig.	Radio	Heating equip't	Heating fuel	Cooking fuel	Furn. in rent?	Mo. cost	Value of property	Mortgaged?	Payment	Pmts. incl. princ.?	Pmts. incl. taxes?	Interest rate	Holder of Mtg.
Run. wat. in. ☐1 Hd. pump in. ☐2 Run. wat. 50 ft. ☐3 Other 50 ft. ☐4 None 50 ft. ☐5	Fl., in, excl. ☐1 Fl., in, shar. ☐2 Nonfl., in. ☐3 Outside ☐4 None ☐5	Excl. use ☐1 Shared ☐2 None ☐3	Elec. ☐1 Gas ☐2 Kerosene, gasoline ☐3 Other ☐4	Mech. ☐1 Ice ☐2 Other ☐3 None ☐4	Yes ☐1 No ☐0	Steam or hot water ☐1 Piped warm air ☐2 Pipeless warm air ☐3 Heating stove ☐4 Other or none ☐5	Coal or coke ☐1 Fuel oil ☐5 Wood ☐2 Kerosene or gasoline ☐6 Gas ☐3 Other ☐7 Elec. ☐4 None ☐8	Coal or coke ☐1 Kerosene or gasoline ☐6 Wood ☐2 Other ☐7 Gas ☐3 None ☐8 Elec. ☐4 C	Yes ☐1 No ☐0 Rent without furn. $.....	Elec. $..... Gas $..... Other fuel $..... Water $.....	$..... No. of units D	Yes ☐1 No ☐0 1st mtg. $..... 2d mtg. $.....	Mo. ☐1 Qu. ☐2 Semian. ☐3 An. ☐4 Other reg. ☐5 No reg. ☐6 Amount of each pmt. $.....	Yes ☐1 No ☐0	Yes ☐1 No ☐0	....% E	Bldg. & Ln. ☐1 Com. Bk. ☐2 Sav. Bk. ☐3 Life Ins. ☐4 Mtg. Co. ☐5 HOLC ☐6 Indi-vid. ☐7 Other ☐8

Water / Toilet / Bath / Light / Refrig. / Radio / Heating equip't / Heating fuel / Cooking fuel / Furn. in rent? / Mo. cost / Value of property / Mortgaged? / Payment / Pmts. incl. princ.? / Pmts. incl. taxes? / Interest rate / Holder of Mtg.
Run. wat. in. ☐1 | Fl., in, excl. ☐1 | Excl. use ☐1 | Elec. ☐1 | Mech. ☐1 | Yes ☐1 | Steam or hot water ☐1 | Coal or coke ☐1 | Fuel oil ☐5 | Coal or coke ☐1 | Kerosene or gasoline ☐6 | Yes ☐1 | Elec. $..... | $..... | Yes ☐1 | Mo. ☐1 | Other reg. ☐5 | Yes ☐1 | Yes ☐1 | ....% | Bldg. & Ln. ☐1 | Mtg. Co. ☐5
Hd. pump in. ☐2 | Fl., in, shar. ☐2 | Shared ☐2 | Gas ☐2 | Ice ☐2 | No ☐0 | Piped warm air ☐2 | Wood ☐2 | Kerosene or gasoline ☐6 | Wood ☐2 | Other ☐7 | No ☐0 | Gas $..... | No. of units | No ☐0 | Qu. ☐2 | No reg. ☐6 | No ☐0 | No ☐0 | E | Com. Bk. ☐2 | HOLC ☐6
Run. wat. 50 ft. ☐3 | Nonfl., in. ☐3 | None ☐3 | Kerosene, gasoline ☐3 | Other ☐3 | | Pipeless warm air ☐3 | Gas ☐3 | Other ☐7 | Gas ☐3 | None ☐8 | | Other fuel $..... | D | 1st mtg. $..... | Semian. ☐3 | Amount of each pmt. $..... | | | | Sav. Bk. ☐3 | Indi-vid. ☐7
Other 50 ft. ☐4 | Outside ☐4 | | Other ☐4 | None ☐4 | | Heating stove ☐4 | Elec. ☐4 | None ☐8 | Elec. ☐4 | C | | Water $..... | | 2d mtg. $..... | An. ☐4 | $..... | | | | Life Ins. ☐4 | Other ☐8
None 50 ft. ☐5 | None ☐5 | | | | | Other or none ☐5 | | | | | | | | | | | | | | |

tions about occupation, industry, and class of worker will relate to the job on which they are currently engaged at the date of the census and not, as formerly, to their usual occupation. Consequently, the results of this census will not be strictly comparable with past census statistics on occupations. It may be possible, however, to determine in a general way which occupations and industries have suffered most from unemployment.

For those seeking work, the last occupation, industry, and class of worker will be reported. Other related items include the number of weeks worked during 1939, the income received in that year from wages or salaries, and the receipt of additional income of 50 or more dollars from other sources.

There has been considerable movement of population within the United States during the past decade. Because so little is definitely known regarding the volume, geographical distribution, and characteristics of this internal migration, a new question on the place of residence on April 1, 1935, will be asked for each person five or more years of age. The results will indicate the population shifts between urban and rural territory as well as between states and broad regions; they will also reveal what kind of people took part in this migratory movement, due largely to the interplay of economic pressure and employment opportunities.

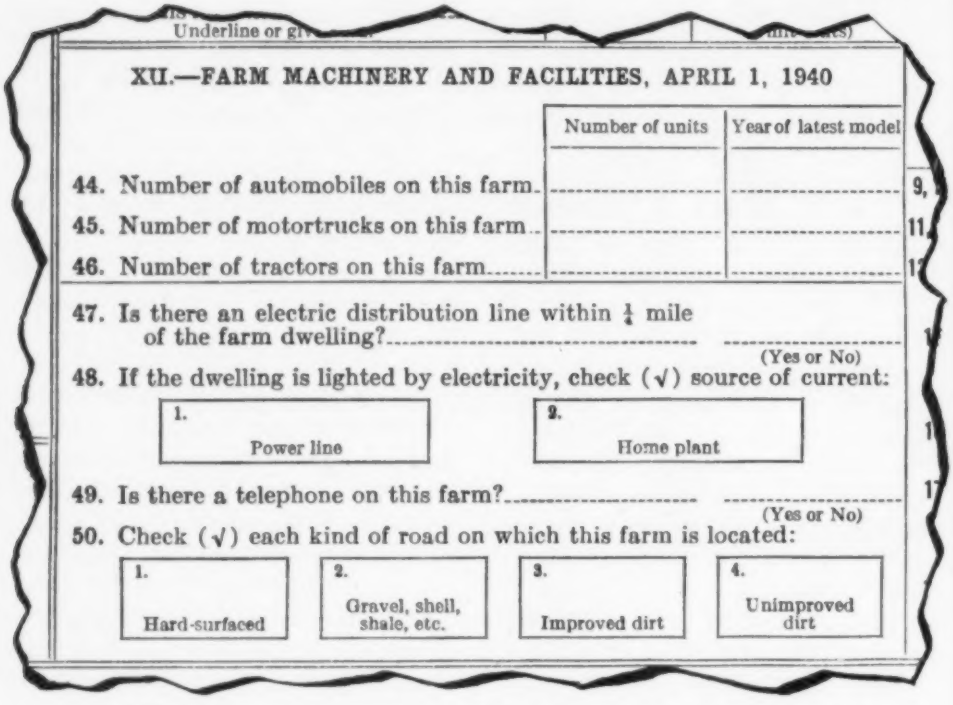
The Housing Census

THE enumerators who ask the population questions will at the same time take the new national census of housing. This marks the first government attempt to obtain a complete, detailed picture of the living conditions of the population. The approach to this objective represents an expansion of the fact-finding surveys conducted in connection with the Real Property Inventories previously mentioned. A sample questionnaire of the occupied-dwelling schedule is reproduced facing this page.

The principal features of the housing census relate to the physical characteristics of the structure in which the home is located, and to the characteristics of the dwelling unit where the family or household resides as distinguished from the main building. The much publicized personal questions on the value of owned property or monthly rental paid, the mortgage status, and the cost of financing are also included.

DETAILED questions seek information about the age of the structure, the need of major repairs, the number of rooms, the extent of overcrowding and doubling up of families, and the essential household facilities such as plumbing, refrigeration, radio, lighting, heating and cooking, and principal fuels used. Information regarding homes with telephones will not be included in this census, though that item will be obtained for farm homes through the medium of the agricultural census. Provision is also made for recording the number of vacant dwelling units and limited information about their characteristics.

This is one part of the decennial census which has been arousing a great deal of controversy. Individuals and organizations have gone on



Underline or gr... ...ines)

XII.—FARM MACHINERY AND FACILITIES, APRIL 1, 1940

	Number of units	Year of latest model	
44. Number of automobiles on this farm			9,
45. Number of motortrucks on this farm			11
46. Number of tractors on this farm			12

47. Is there an electric distribution line within ¼ mile of the farm dwelling? _____ (Yes or No) 1

48. If the dwelling is lighted by electricity, check (√) source of current:

1. Power line	2. Home plant

1

49. Is there a telephone on this farm? _____ (Yes or No) 1

50. Check (√) each kind of road on which this farm is located:

1. Hard-surfaced	2. Gravel, shell, shale, etc.	3. Improved dirt	4. Unimproved dirt

SECTION XII OF THE FARM AND RANCH SCHEDULE

This schedule, slightly enlarged in the reproduction above, is of interest to telephone people because of the inclusion of Question 49—the only appearance of this item on any of the census schedules

record as regarding it an invasion of individual privacy, and it is known that in the past some of the Real Property Inventories met some opposition for similar reasons. It has been pointed out that if the inclusion of the housing schedule arouses resentment, this attitude would be unfavorable to obtaining the best results in other sections of the census.

The Agricultural Census

IN addition to the questions on population and housing, farmers will answer separate agricultural questionnaires. The farm census will seek information regarding acreage, crops and livestock, labor and mechanized equipment, the extent of tenancy compared to farm ownership, and such financial items as farm values, expenditures, debts and taxes. In addition, there are certain questions relating to farm facilities in which the telephone industry is particularly interested, because the extent to which farms are supplied with these modern conveniences serves as one measure of the market for its services. Due to this interest, the section of the farm schedule which contains the questions regarding these features is reproduced in the accompanying illustration.

All crop production and similar data relate to the calendar year of 1939. Data on drainage and irrigation projects connected with farming operations will be included in the agricultural census.

Other Enumerations

THE so-called business census will cover the channels and agencies through which commodities are distributed and the essential services rendered. This partly corresponds to the Census of Distribution of 1930 and to the special business census of 1935. Difficulties of classification of business concerns made those censuses of doubtful value in connection with many studies, and too much must not be expected of the present census. However, the only way to find out how to take a satisfactory census of business is by experiment, and there is justification for making the attempt to learn the pertinent facts on this subject.

The scope of this census covers retail and wholesale trade, service businesses and laundries, theatres and other places of amusement, hotels and tourist camps, the construction industry, and sales finance companies. This is the first time there has been a separate schedule for finance companies. Eleven separate schedules will be used for different types of business concerns, breaking down into considerable detail the several branches of the distribution system.

THE Biennial Census of Manufactures, covering manufacturing activity in the United States for the calendar year 1939, will be taken in conjunction with the 1940 decennial census. For the purpose of the census, "manufacturing" covers establishments engaged in the processing of goods or in the assembly of parts into a finished product, whose annual production in 1939 was valued at $5,000 or over. The more important features of this census will include the number of plants and value of products, the number of employees and the wages and salaries paid, the cost of materials and the value added by manufacture, and a classification of plants by industry groups. Information also will be recorded on expenditures for recent plant expansion and for new equipment, and for the first time since 1930 a check will be made on power facilities.

THE decennial census of mines and quarries will be taken in coöperation with the Bureau of Mines as part of the 1940 Census. This inquiry will include all mining activities for the calendar year 1939. Of special interest in this field, as well as in the larger realm of manufacturing, will be the light it may throw on the increased productivity of labor.

Releasing the Results

THE Census Bureau expects to certify the population returns to the President within eight months after the start of the census, for the purpose of reapportioning Congressional representation. It will probably be two years before the population material will be fully available in the final bound volumes, and this will be true of the other censuses. However, upon completion of the census field work, preliminary population figures will be

released locally by supervisors for all places having 2,500 or more inhabitants, and in some cases they may give out the results for communities having less than 2,500 population.

It should be emphasized that no family figures or such detailed population data as nativity, age, sex, etc., will be available in any preliminary releases. No definite date for the early release of provisional data from the non-population sections of the census can be predicted, although they are almost certain to be delayed beyond the publication of population figures.

THE data in the decennial census of principal interest and usefulness to the telephone industry will be those items which will be most helpful in analyzing and evaluating the market for its services: first, the size of the market measured in terms of families, farms, and firms (the last item classified according to business function); then the distribution of the market by geographical location and by types of political divisions, cities (large and small), suburban places, agricultural areas, and non-farm rural territory. The data on the redistribution of population through migration will be important.

Finally, as to the characteristics of the market, a wealth of material will become available. The relative proportions of native white, foreign born, and colored, the age composition, and the average size of private families are fundamental factors. The amount of education, the employment status, and income levels will establish an economic grading of the market. Furthermore, housing data such as value of property, characteristics of dwelling units, and the equipment and facilities of the homes will greatly assist the statistician and the engineer in their market studies.

Experience has indicated that census data are of much value in the telephone business. It is clear, however, that the extent of their usefulness will depend in a large measure upon careful analysis and intelligent interpretation combined with good judgment, as well as recognition of any limitations inherent in the returns.

MORE TELEPHONE BUILDINGS

IN CONNECTION with a group of photographs of Bell System buildings gathered together some years ago, President Walter S. Gifford of the American Telephone and Telegraph Company wrote:

"These buildings are typical of the structures, large and small, which are being erected to care for the service requirements of the Nation's rapidly growing telephone system. In their design and construction, these buildings reflect the policies of the Bell System. They are planned to provide at reasonable cost for present service needs and for the continuing growth of telephone use. Modern in conception, they also reflect in their substantial character and careful planning something of the System's stability and its regard for the comfort and convenience of its customers and its employees. These buildings contribute toward the achievement of the ideals of the communities in which they are located and exemplify the progressive spirit which has made possible modern telephone communication as it is today and as it will be in the years to come."

The group illustrated on the following pages, representative of the varied sizes and types of the many buildings constructed in recent years, is indicative of the Bell System's adherence to those objectives.

A similar group of System buildings was shown, under the same title, in the BELL TELEPHONE QUARTERLY for October, 1936.

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NEW HAVEN, CONN., ADMINISTRATION

R. W. Foote and Douglas Orr, *Architects*

BROOKLYN, N. Y., ADMINISTRATION

VOORHEES, GMELIN & WALKER, *Architects*

ST. PAUL, MINN., DOWNTOWN

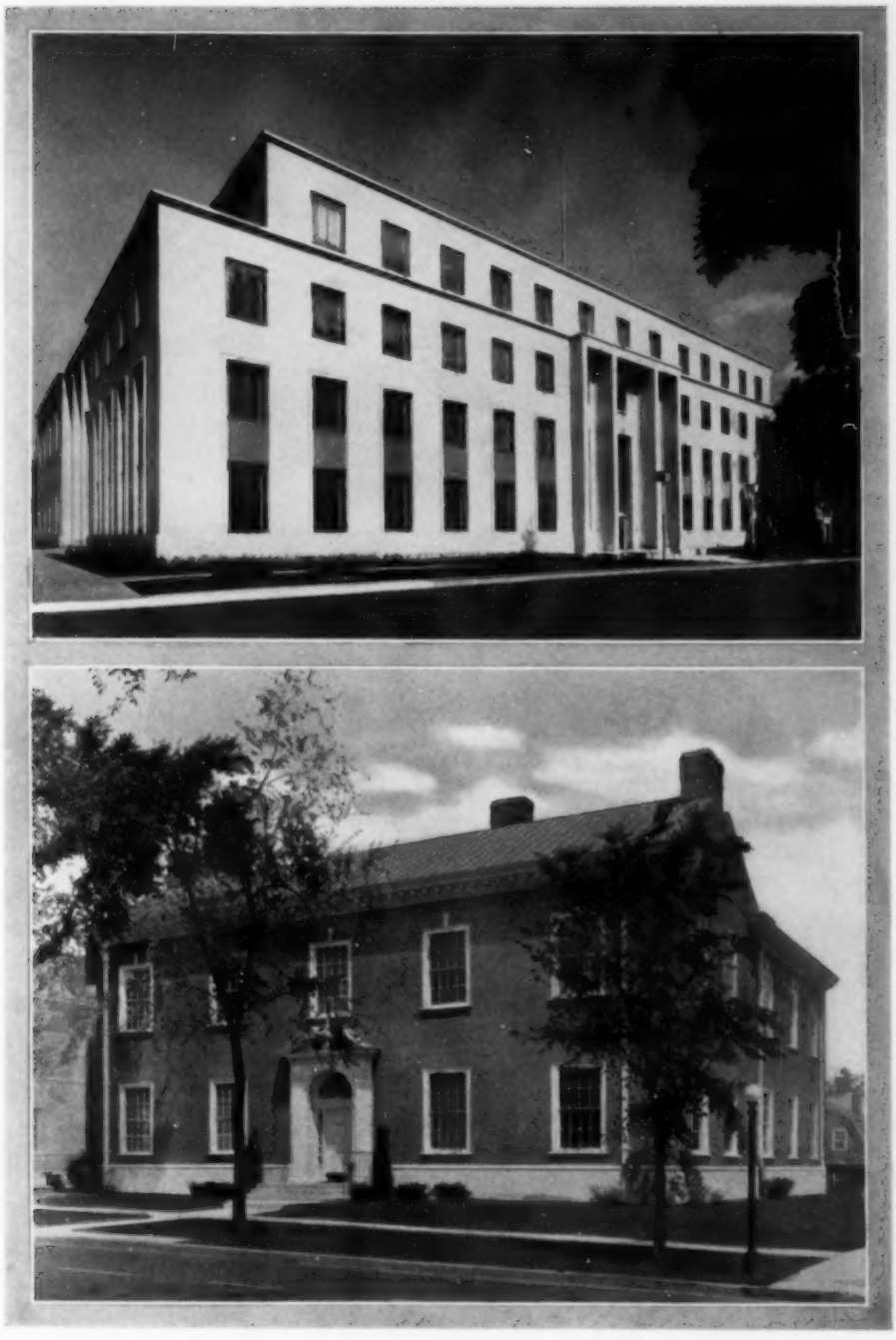
C. H. JOHNSTON, *Architect*

OTTAWA, ONT., CANADA

E. I. Barott and F. J. Macnab, *Architects*

CLEVELAND, OHIO, LAKEWOOD

Edward G. Conrad, *Architect*

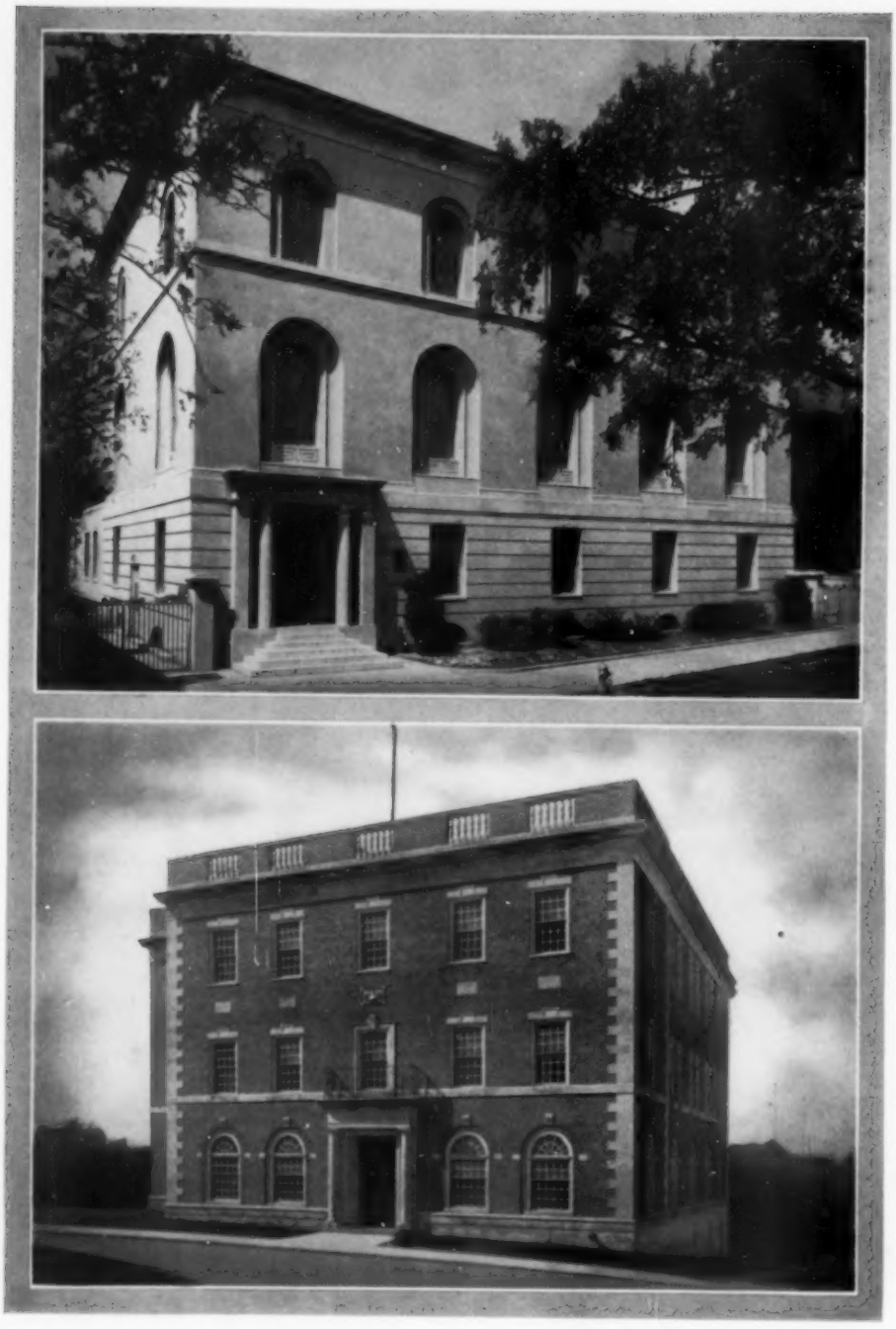


SPRINGFIELD, ILL.

HOLABIRD & ROOT, *Architects*

DENVER, COL., NORTH

R. C. BRYANT, *Architect*

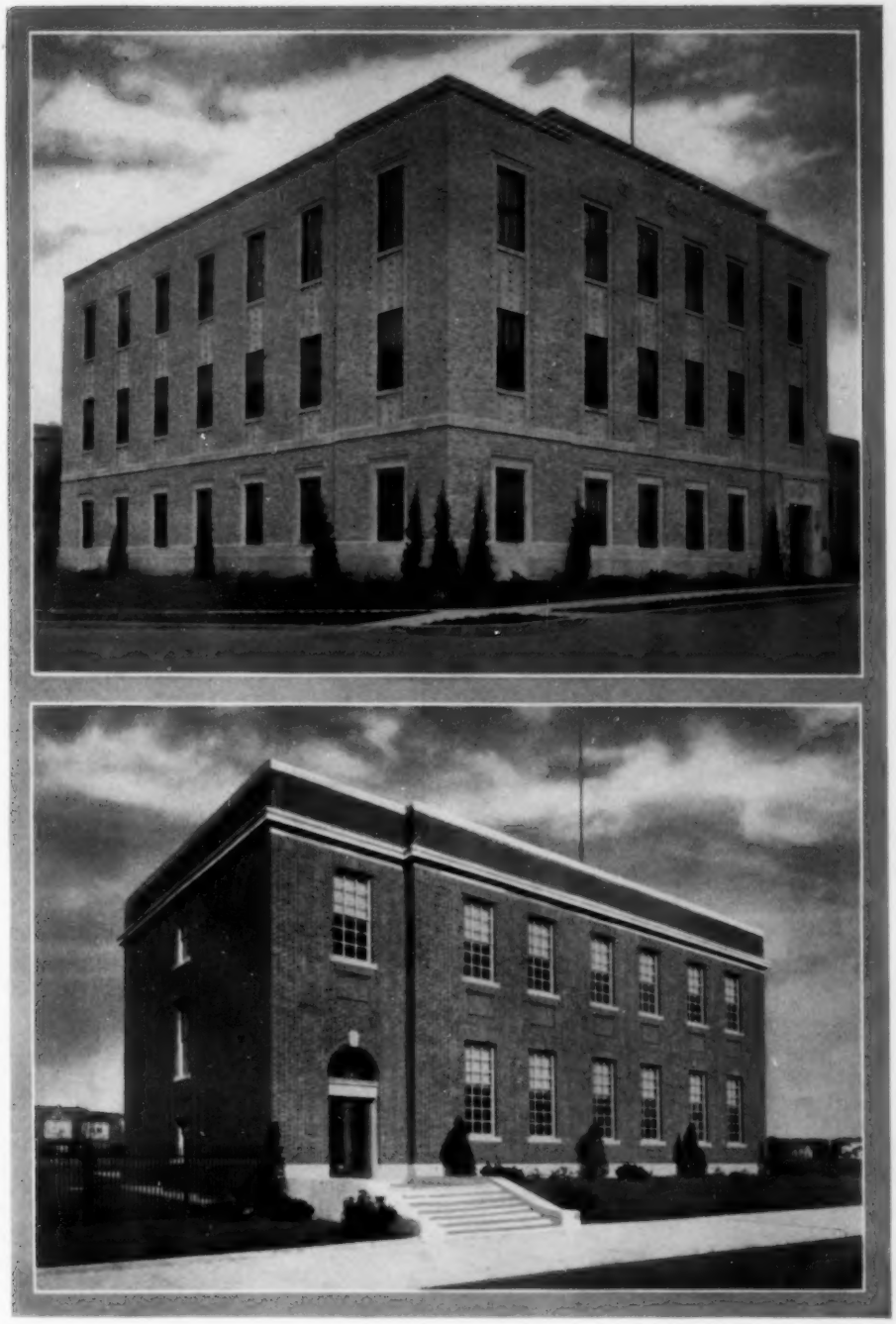


CHARLESTON, S. C.

HENTZ, ADLER & SHUTZE; J. WARREN ARMISTEAD, Associate; *Architects*

EAU CLAIRE, WIS.

HERBST & KUENZLI, *Architects*

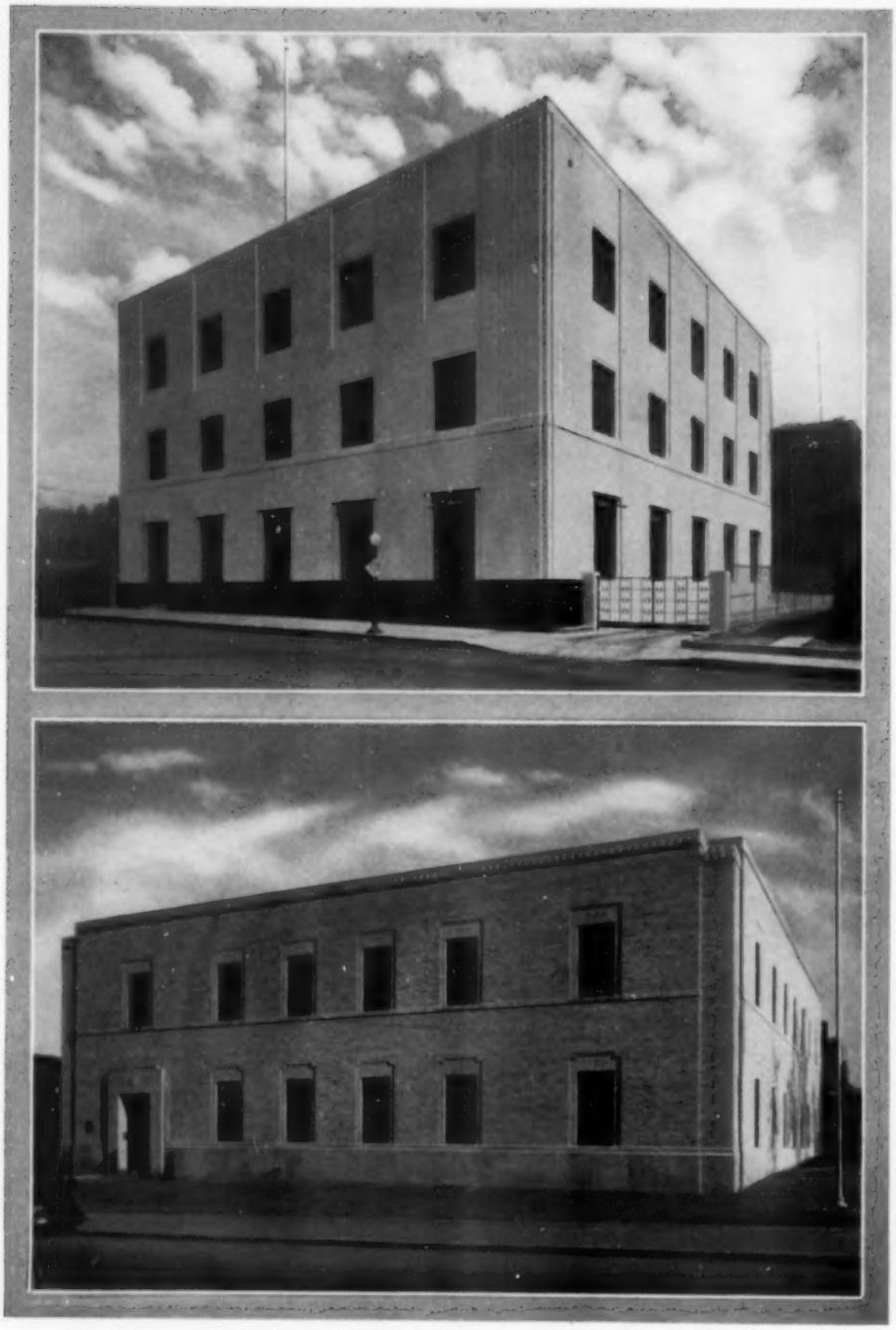


CORPUS CHRISTI, TEX.

I. R. TIMLIN, *Architect*

PHILADELPHIA, PA., MAYFAIR

ZANTZINGER & BORIE, *Architects*



GLENDALE, CAL.

JOHN PARKINSON & DONALD B. PARKINSON, *Architects*

KANSAS CITY, KAN., DREXEL–FAIRFAX

I. R. TIMLIN, *Architect*

CHICAGO, ILL., OAKLAND

HOLABIRD & ROOT, *Architects*

SANTA FE, N. M.

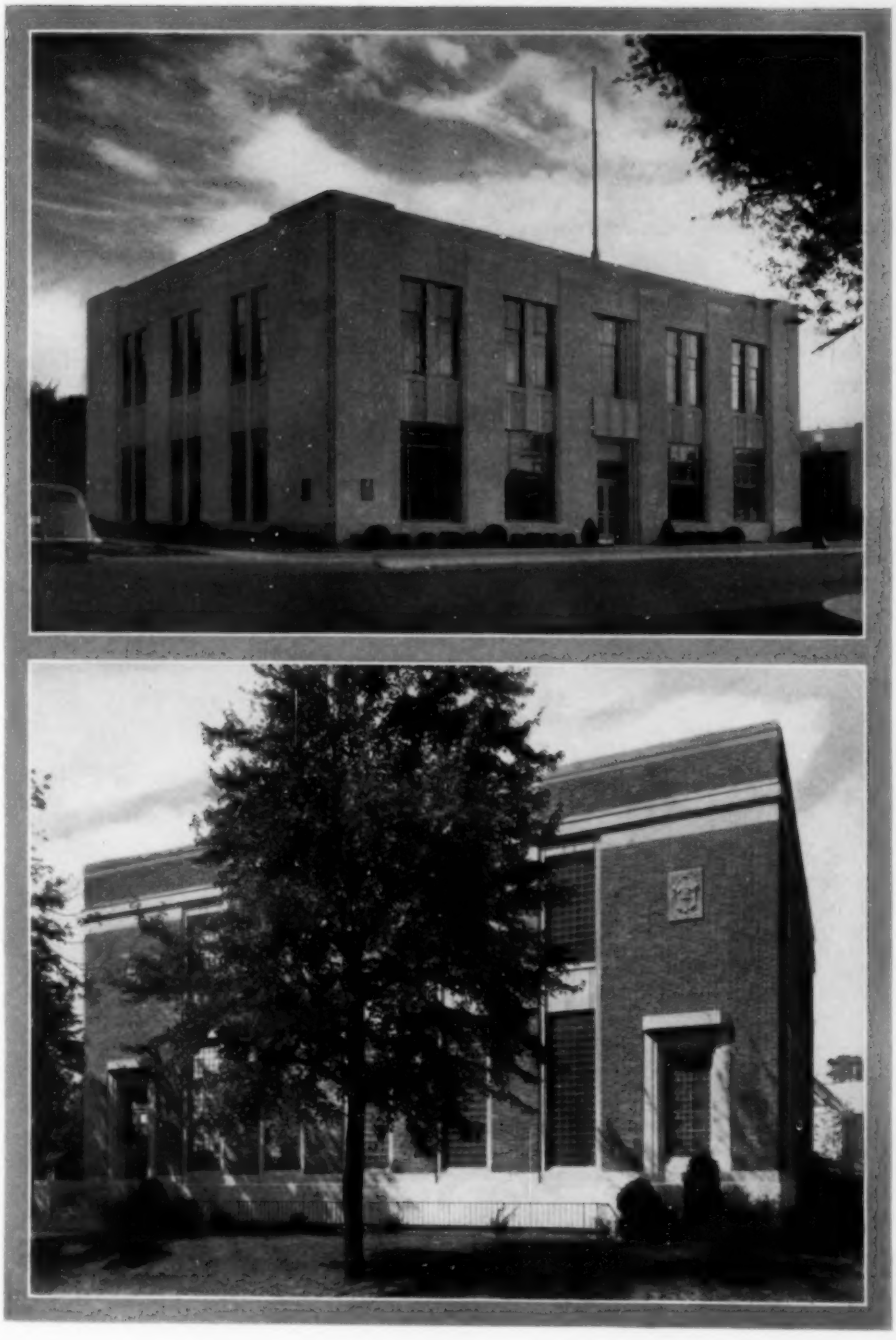
R. C. BRYANT, *Architect*

MORGANTOWN, W. VA.

MEANOR & HANDLOSER, *Architects*

DETROIT, MICH., VERMONT

SMITH, HINCHMAN & GRYLLS, *Architects*

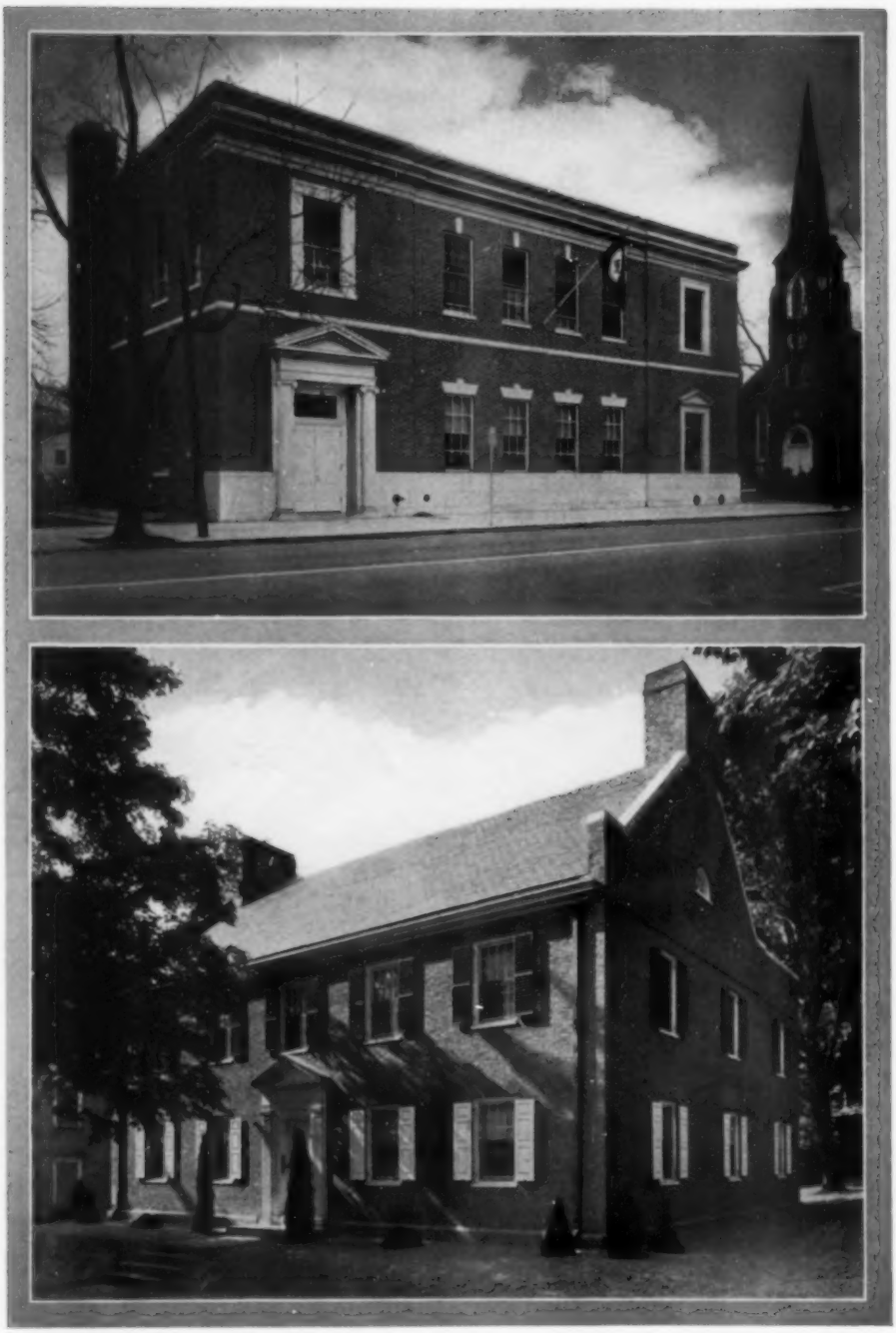


OLYMPIA, WASH.

BEBB & GOULD, *Architects*

CINCINNATI, OHIO, VALLEY

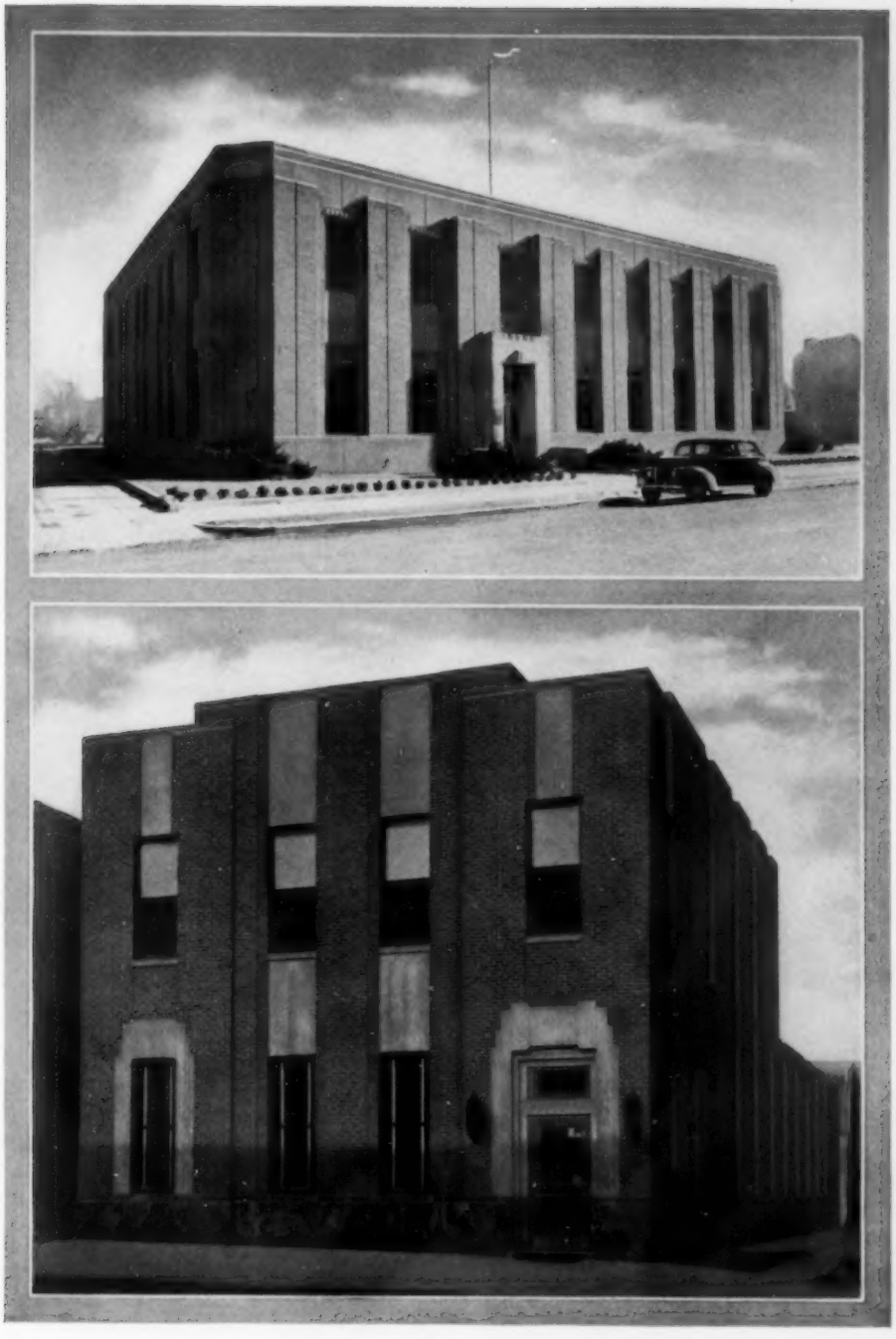
HARRY HAKE & HARRY HAKE, JR., *Architects*



MILLBURN, N. J.

NORWOOD, MASS.

P. A. Hopkins and Densmore, LeClear & Robbins, *Architects*

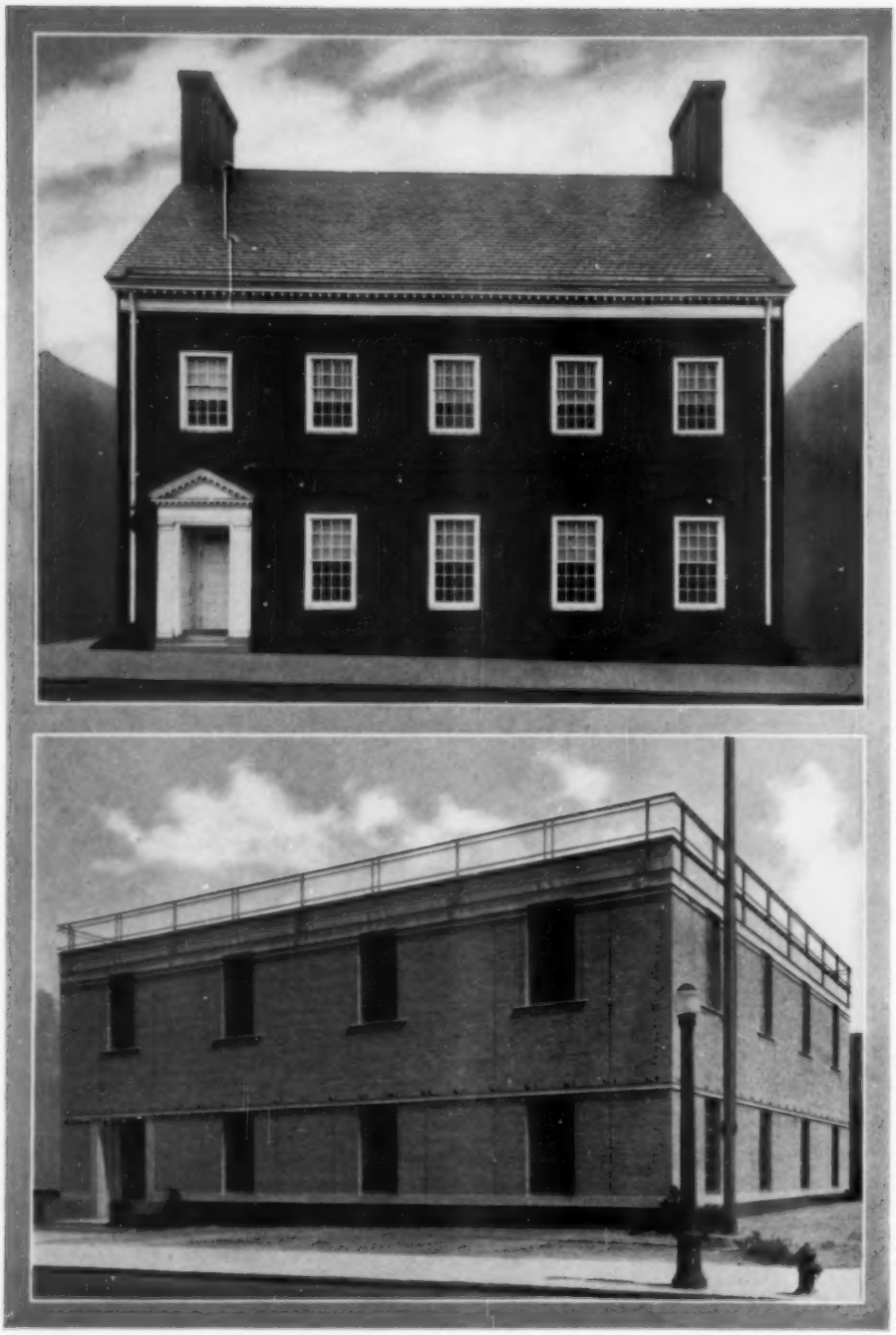


ARLINGTON COUNTY, VA., CHESTNUT

MERRILL C. LEE, *Architect*

MARSHALLTOWN, IA.

JOHN NORMILE, *Architect*

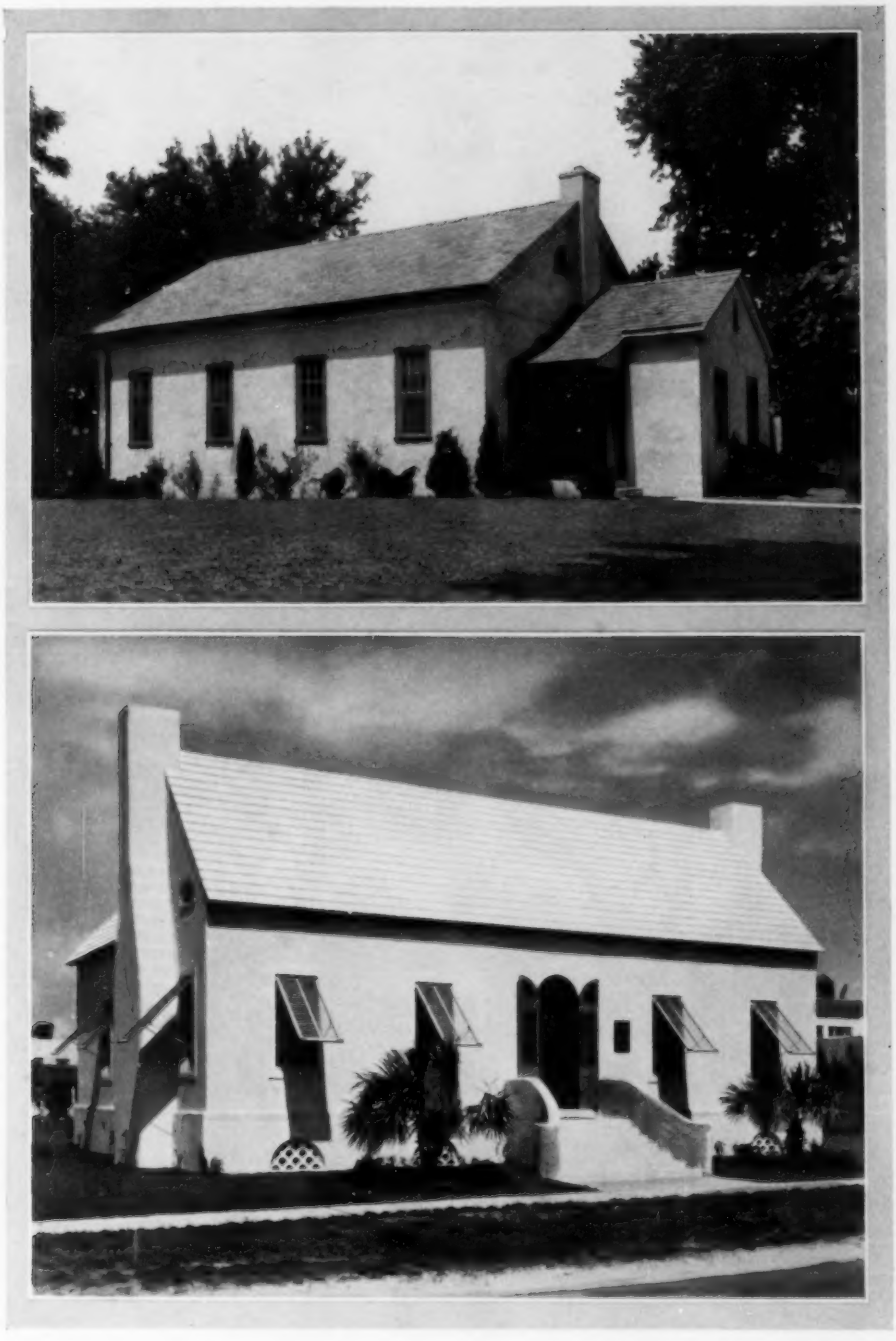


ANNAPOLIS, MD.

TAYLOR & FISHER, *Architects*

BUFFALO, N. Y., HUMBOLDT–TYLER

VOORHEES, GMELIN & WALKER, *Architects*



HOLLY OAK, DEL.

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EAST BERNE, N. Y.
F. A. WARD, *Architect*

PERRYSVILLE, PA.
PRESS C. DOWLER, *Architect*

FAIRFIELD, CONN.
DOUGLAS ORR, *Architect*

FRANKFORT, KY., LONG LINES REPEATER STATION

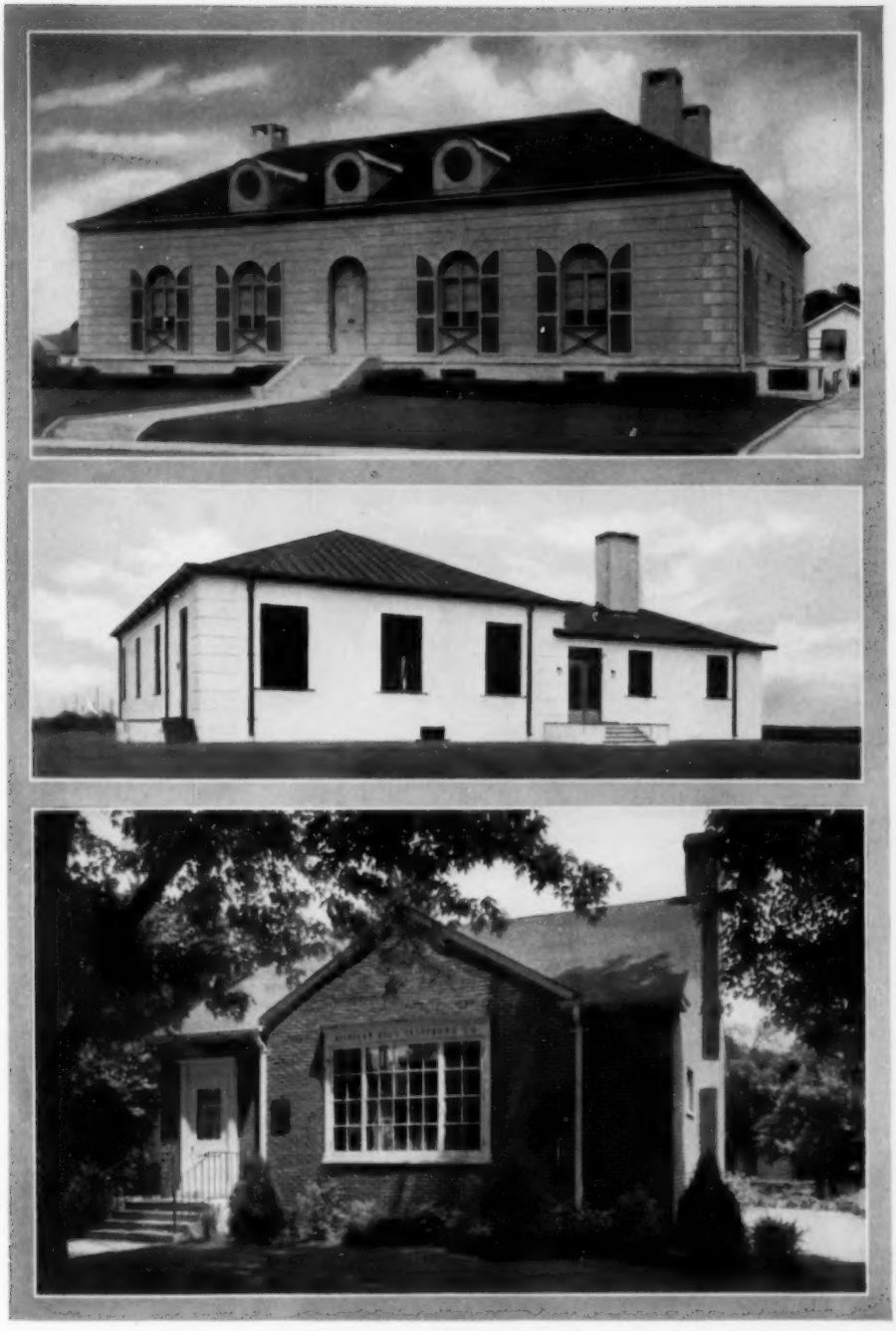
HARRY HAKE & HARRY HAKE, JR., *Architects*

INDIANAPOLIS, IND., BROADWAY

VONNEGUT & BOHN, *Architects*

WESTBORO, MASS.

DENSMORE, LECLEAR & ROBBINS, *Architects*



SHREVEPORT, LA., NO. 7

HENTZ, ADLER & SHUTZE; J. WARREN ARMISTEAD, Associate; *Architects*

MANAHAWKIN, N. J., LONG LINES RADIO-TELEPHONE RECEIVING STATION

VOORHEES, GMELIN & WALKER, *Architects*

ROCHESTER, MICH.

SMITH, HINCHMAN & GRYLLS, *Architects*

STE. ANNE DE BELLEVILLE, P. Q., CANADA

F. J. Macnab, *Architect*

TOLEDO, OHIO, WALBRIDGE

Mills, Rhines, Bellman & Nordhoff, *Architects*

CINCINNATI, OHIO, DELHI

Harry Hake & Harry Hake, Jr., *Architects*

NORFOLK, VA., HARBOR AND COASTAL
RADIO–TELEPHONE STATION

MERRILL C. LEE, *Architect*

TROUT LAKE, WIS.

TOLEDO, OHIO, LONG LINES TYPE K CARRIER EQUIPMENT STATION

THE TELEPHONE AS A SOCIAL FORCE*

As an Instrument of National Solidarity, and as a Means for Expediting Business and Personal Affairs, the Service Makes Significant Contributions to the Country's Progress

By ROBERTSON T. BARRETT

DURING the pioneering days, when new areas were being opened in the West, various forms of *one-way* communication served the needs of the nation fairly well. It took days or weeks to send a letter and receive a reply; it often took hours, and always minutes, to send a telegram and get an answer back. Up to the end of the first century of our national history, or thereabouts, nobody particularly cared. But with the faster tempo of industry and commerce, the time was soon to come when a nation geared to high speed would no longer be satisfied to make its business and social contacts by means of *one-way* communication, no matter how rapid it was. The needs of the nation demanded some form of communication that could overcome distance and time, but that would be, nevertheless, as intimate and personal, as direct and reciprocal, as a face-to-face conversation. That form of communication only the telephone, by transmitting the voice itself, could provide.

Not that the nation as a whole was as yet, in 1876, at all aware that the telephone could or would meet this need. It was desperately hard, at first, for Bell and his financial backers to persuade the "practical" business men of their day that the telephone was anything more than an amusing toy. As an instrumentality of human service, as a force that could have any possible historical or social significance, they saw no future for it. But that future was assured, for the need for the telephone existed, though perhaps only potentially. And as the need grew with changing conditions, and as it was met by the creation of a telephone service that was best suited to those conditions, the mark which the telephone was making upon American life became more and more indelibly impressed upon the nation as a whole—which is the measure of the telephone's historical significance.

It is almost a platitude to say that in a democracy, as in no other form of government, an enlightened public opinion is one of the chief foundation

* Parts of an address delivered on April 1, under the title "The Historical and Social Significance of the Telephone," in the series of Out-of-Hour Lectures, 1939–40, given by the New York Telephone Company at its Headquarters in New York City.

stones of wisdom and fairness in the making of laws and of intelligence and integrity in their administration.

Now, hardly less important than facilities for the publication and distribution of the printed word, as instrumentalities for the formulation of public opinion, are those which have to do with the transmission of intelligence over distances. Common understanding and enlightened public opinion are almost exactly proportional to the number and efficiency of facilities for a free exchange of ideas between individual and individual, state and state, section and section.

A Free Press and Enlightened Public Opinion

DUE to many noteworthy advances in journalism since 1876, the press has come to play an increasingly important role as a moulder of public opinion during that period. Not the least of these advances is the use of the telephone in newspaper work. We need have learned very little about how a modern newspaper is put together to know that in the process of getting the news, and getting the opinions of leading men on vital issues, the telephone is a factor of outstanding importance.

Without telephone service, modern journalism would be impossible. Trace any piece of news on the front page of your daily paper, tomorrow morning, to its source, and I venture to assert that, somewhere along the line between the event which is recorded and publication of the story in the paper, you will find a reporter at a telephone, talking his story to a "rewrite man" at the office of a newspaper or a press association. And the chances are that you will find this combination of speaker and listener repeated many times in connection with a single news story, as facts are checked back, new angles explored, new developments discovered. Thus, in large measure by telephone, is America's news collected.

And by facilities which telephone research has made possible, this news is distributed to hundreds or thousands of newspapers from one end of the country to the other. By teletype, by the transmission of photographs or facsimiles over wires provided by the Bell System and, to some smaller papers, by the telephone itself, this news is sped throughout the nation—and as it appears in print, it becomes the stuff out of which public opinion is created.

WITHIN the past decade and a half or so, two other potent instrumentalities for the formation of public opinion have appeared on the American scene—both of them direct results of telephone research. The sound moving picture, as we now know it, was developed and first demonstrated by Bell System engineers. Even more directly, the radio telephone is, of course, a descendant of Bell's telephone of 1876. In radio network broadcasting, moreover, the highly engineered circuits used in linking hundreds of stations with the source of the broadcast material are made possible by telephone research and are provided over the nation-wide web of wires which the Bell System has thrown across the continent.

Profound, indeed, have been the changes in this one aspect of Ameri-

can life since Bell spoke the first sentence over the telephone, on that March day in 1876. One of the most significant of the telephone's contributions to the life of our nation, as a nation, has been that it has helped to bring about what may truly be called a sense of national solidarity. We do not, and never shall, all think exactly alike; but modern communication has made it possible for us to learn what our neighbors—even those across the continent—are thinking in regard to the same problems that confront us.

These communication facilities—and among these the telephone is by no means the least effective or the least important—have given a new meaning to the principle of majority rule; have afforded, for majorities and minorities alike, an opportunity of expressing their opinions to audiences which have grown larger and larger in numbers and wider and wider in geographical distribution; have afforded new guarantees that, whatever may be the conflict between majorities and minorities, the United States, in its essential principles and purposes, shall still remain *united*.

LET us consider another phase of the influence of communications in general and of the telephone in particular as factors in the functioning of our democratic form of government. It is said that Daniel Webster expressed himself as strongly opposed to the annexation of Oregon to the United States because, as he contended, a Congressman elected to represent that region in Washington would have to spend most of his two-year term in traveling to the national capital and back again, and while there he would have no means of knowing the wishes of his constituents on issues before Congress.

That was a very real difficulty in Webster's day. But all modern forms of communication have played important parts in keeping our lawmakers in touch with their distant constituents—as witness the floods of letters and telegrams which pour into Washington when the public becomes really excited. Public opinion has found new ways of expressing itself. But of all these forms of communication, the telephone is the most direct and personal, and I dare say that many nebulous ideas on the part of legislators, and perhaps of executives, have been transformed into history-making decisions in the course of long distance telephone calls between Washington, D. C. and points north, east, south and west.

Antidote for Provincialism

ANOTHER aspect of the telephone's significance as a maker of American history is its influence as an antidote to provincialism. When Patrick Henry cried, "I am not a Virginian, I am an American," he voiced a sentiment to which we all, I am sure, subscribe—in principle. But in practice, it is perhaps more characteristic of Americans than of any other people in the world to cherish an inordinate pride in the particular spot on the map that they call home. In his delightful poem, "The Village Oracle," Joseph C. Lincoln graphically portrays and personalizes this particular form of provincialism:—

Old Dan'l Hanks, he says this town
Is just the best on earth;
He says there ain't none, up nor down,
That's got one half her worth;
He says there ain't no other state
As good as our'n, nor near
And all the folks that's good and great
Are settled right round here.

Says I, "D'y'ever travel, *Dan?"*
"You bet I ain't," says he;
"I tell you what, the place I got
Is good enough for me!"

We are all, I am afraid, Dan'l Hankses at heart, and we would be even more provincial in our viewpoints if it were not for modern communication methods. As long ago as 1834, a Postmaster General of the United States, in commenting on the fact that some mails had been carried on railroad trains, said: "That which shortens the time of communication, and facilitates the intercourse between distant places, is like bringing them nearer together. While it affords convenience to men of business, it tends to *counteract local prejudices, by enlarging the sphere of acquaintance.*"

That was written more than a hundred years ago, forty years or more before the telephone was invented. It is as true now as it was then, and far more so. For the telephone does more than merely "shorten the time of communication"—it actually projects human personalities. You cannot talk to a man in Boston, or Chicago, or New Orleans, or San Francisco—even though every word you both speak has to do with matters that are "strictly business"—without finding out something about what kind of man he is, or revealing what kind of man you are. It is an education in Americanism thus to become acquainted with our fellow Americans. The facilities which make possible those long distance meetings of mind with mind are national assets of incalculable value.

One other point, while we are on the national aspects of the subject we are discussing: the significance of the telephone as related to national emergencies. Disasters like the hurricane of 1938 are so far-reaching in their effects that, although their physical destruction may be confined to one state or a half a dozen states, we have come to recognize them, quite properly, as national emergencies. When such disasters strike, communication becomes of more than ordinary importance, and the swift, two-way service that the telephone affords becomes of even greater importance than other forms of communication.

THERE is no need to tell telephone people of how telephone people behave in such an emergency, nor to attempt to evaluate the significance of an efficient, dependable telephone service to the nation, as a nation, when such disasters occur.

And there is, unfortunately, another form of national emergency—the emergency of American participation in war. Those of us who remember the World War years need not be reminded, I am sure, of the significance of a nation-wide telephone service—of the part which the telephone, and telephone men and women, played in the making of the American history that was written during those tragic years. And I do not need to tell you, as telephone people, that if, as we hope may never be the case,

America is called again to face such an emergency, America must face it as a *united* nation, and that, once more, the telephone must play its part in keeping it *united* in thought and word and action, as well as in name. And, if such an emergency arises, you and I, or the telephone men and women of that day who are our successors, will be making American history, just as telephone men and women have always done in all emergencies.

Service of National Significance

THE historical significance of the telephone—that is, its effect upon the nation as a whole—is chiefly a matter of the significance of the fact that the United States *has* a *nation-wide* telephone service.

Now, it is important to remember that nation-wide telephone service is celebrating its twenty-fifth anniversary this year. Just a quarter of a century ago, on January 25, 1915, the first transcontinental telephone line was opened for service. Before that, there had been no service that included the whole of the United States. It is, therefore, perhaps peculiarly appropriate that we should have devoted a portion of our discussion to the national or historical aspects of the significance of the telephone, of telephone service, and of the work which we, as telephone people, are doing.

We have found that the historical or national significance of the telephone grows chiefly, though not exclusively, out of the improvement and extension of facilities for *long distance* service. Similarly, we shall find, I think, that its social significance is chiefly, though not exclusively, a matter of the growth and improvement of *local* service. What the telephone has done to change the lives of men as they live in their own homes, as they work in their own offices and, to a more limited degree, as they spend their leisure hours during week-ends, holidays and vacations —that is the basis of its social significance.

Beginning nearest home—with urban and suburban conditions—we know that the lives you and I have lived since we awoke this morning, and shall live until we go to bed tonight, are far different from those we would have lived if Bell or someone else had never invented the telephone. Certainly our business life is geared to the tempo which the telephone sets. We make a dozen business contacts today in the time which the business men of the 'eighties spent in making one. We not only project our personalities to distant places—we multiply our personalities. We defy nature by being in two places at once. If we use a conference circuit, the number of places we can be at the same time may be greatly extended.

BUT in its social aspects, the business telephone is, of course, less directly important than the residence telephone. We spend, on the average, only about a third of each twenty-four hours in earning our living; the remainder we spend in rest, recreation, or in those human contacts which have to do with our life as social beings. During these hours, the telephone influences us not as we make a living, but as we live.

The Servant of the Home

IF we go back once more to the state of telephone development as it existed fifty years ago, we shall find that a very large proportion of all the telephones in service were business telephones. The invention of Bell had won recognition as a valuable adjunct to the doing of the world's work in office and factory. It had not yet gone far toward winning like recognition as a social instrumentality. America had not yet become a nation of home telephones. Such homes as had telephones were the homes of the wealthy or the comparatively well-to-do.

Now, during the past fifty years, the home telephone has come to be considered no longer a luxury, but a necessity. In the earlier stages of telephone development, people installed telephones, and particularly in their homes, only when they were reasonably assured that such telephones would be frequently used. Now they install them, even though they may be used relatively infrequently, because they are recognized as necessities. They are installed not alone on the basis of their actual use, but on the basis of their potential usefulness; not on the basis of the number of calls that will actually be made over them, but on the basis of the value of a single call, made at a time when swift and dependable communication is absolutely essential.

This increase in the number of homes which have telephones has profoundly affected our social life. We said a moment or two ago that every act, from the time we arise until we go to bed, is likely to be influenced in some way by the availability of telephone service. As a matter of fact, even our hours of sleep are affected—for telephone service is a twenty-four hour service and the telephone at our bedside stands guard over us during the night hours, to summon aid if an emergency arises. The communication which the telephone stands ready to provide has been and is a vital factor in the protection of life and property against the enemies of law and order. It is a stabilizing factor in society; a preserver of the peace; an instrumentality of safety, security, and orderly living.

IF the telephone guards us while we sleep, it touches our lives during our waking hours in scores of ways of which we are, in many cases, scarcely aware. We arise and, in due course, find ourselves at the breakfast table. The fruit with which we begin our repast was, in all probability, guarded from frost while it was growing through weather warnings made possible because Bell did what he did in 1876 and because of what a lot of Bell System people have been doing ever since. In all probability it was sold to some wholesale fruit dealer as a result of a long distance telephone call. Ten chances to one it was ordered, by the Little Lady who sits across the breakfast table from us, in the course of a telephone call to the retail store around the corner—along with the breakfast bacon, the coffee, the bread for the toast, the butter.

The truth of the matter is that the telephone has profoundly affected the distribution of the food, clothing, and other necessities for which a part of

our budget goes. It has helped to facilitate and extend production and distribution so that, in many cases, retail costs have been reduced through increased volume of sales. As a result, you and I can now afford to eat and wear what our fathers thought to be luxuries, beyond their reach. It has not been the only factor, but it *has* been a factor, in bringing about the standard of living of which we Americans are so justly proud. We are what we are, economically, and hence socially, in no small part because rapid and direct communication by the spoken word has helped to gear the production and distribution of necessities and luxuries alike to an increasing tempo.

IT is to be admitted that a high standard of living has not solved and cannot alone solve all of our social problems. The fact that great numbers of people have roofs over their heads and food in their stomachs does not, unfortunately, prevent us from having great numbers of people who have neither of these things to any satisfactory degree. So that any contribution which the telephone has made toward bringing about in America better economic conditions has been, at best, of only indirect social significance.

But the telephone has had a much more direct bearing on the relationships between men and their fellows. There is inherent in the philosophy of most individuals, and in the point of view of most families, a sort of family provincialism that is only an abridged edition of the provincialism to which we have already referred as applying to communities. It is expressed in the words of the Deacon who, saying grace, offered this petition:

> *O Lord, bless me and my wife;*
> *My son John and his wife—*
> *Us four*
> *And no more.*

The telephone, I submit, has social significance because it is peculiarly fitted to act as an antidote for that kind of smugness, narrowness, and self-satisfaction. Provided at a cost so low that it is within reach of millions, telephone service cuts across the lines of economic classification and social caste. It is not the peculiar property of the rich, the cultured, or the politically powerful. It serves all who need it, regardless of birth or background, race, creed, or religion. And because it is thus all-inclusive, it makes its users better citizens of the American democracy.

Transacting the Business of the Community

HAVE we ever stopped to think—we telephone folks who live in suburban communities—how much of our community business is transacted by telephone? And by community business I do not mean business in the ordinary sense—the buying and selling of bread, butter, and other necessities. By "community business" I mean the more important business of getting along together, coming to know each other better, sharing our community responsibilities with each other. Have we ever stopped to think how much of that kind of vitally important business is handled, quickly and efficiently—and withal sympathetically and un-

derstandingly—because you and I and most of the other folks like us have telephones in our homes?

Those of you who live in suburban communities will testify, I am sure, to the important part which the telephone plays in the activities of such institutions as the local churches, the hospital, the Red Cross, the community improvement association (or its equivalent under another name), the parent-teachers' organization, and other projects, enterprises, movements, or groups of people that are essentially public-spirited and community-minded in purpose and in practice. A large proportion of the work of such organizations is done, not at formal meetings, but by means of conversations over the telephone. These contacts not only facilitate the particular work with which the discussions are concerned, but draw neighbor nearer to neighbor and help to create a community consciousness.

Use of Local Communications is Increasing

THERE seems to be evidence that these *local* contacts, not alone by telephone, but by mail and other means of communication, are increasing more rapidly, in proportion, than contacts which reach beyond the limits of the communities in which men make their homes. During the administration of President Hoover, a committee was appointed to study Social Trends as they were then manifesting themselves. One of the aspects of the subject to which investigators were assigned was Communication, and a section of the committee's report on this subject, by Malcolm M. Willey and Stuart A. Rice, affords much to reward a reading, in spite of the fact that it was predicated on conditions existing a decade or more ago.

Among other interesting points brought out was a study of the frequency with which the average American utilized the various communication agencies at his disposal. A tabulation was included which showed the frequency rates, or "average utilizations," of each agency, as calculated for the years 1907 and 1927.

IT was shown that in 1907, the average person in this country received a local letter once in every 18 days; in 1927, once in every 9 days. He received a non-local letter once in six days in 1907; once in four days in 1927. He took part in a local telephone call once in three days in 1907, and once in one and one-half days in 1927. He took part in a toll telephone call once in four months and fifteen days in 1907, and once in one month and ten days in 1927. He received a telegram once in eleven months and two days in 1907 and once in six months and twenty-three days in 1927. The receipt of a cablegram, according to these statistics, seems to have been something like the appearance of Halley's comet. You and I average Americans got one once in fourteen years, three months and fourteen days, as of 1907, and once in eight years, four months and two days in 1927.

Among the observations based upon this study were:

"Local contacts are more numerous than non-local contacts, because of the wide diffusion and

habitual use of the telephone, which instrument dominates the field."

"Relatively, local contacts have increased more rapidly than non-local contacts."

THE report states: "In general, the tabulation indicates that except for toll telephone calls, contacts within narrower boundaries that may be designated as the local area have been increasing at a more rapid rate than contacts that are non-local. And the single exception may in reality not be such, since it involves a tremendous traffic in suburban telephone messages which may be of local significance."

The writers went on to suggest what was admittedly only an hypothesis: "The intensification of local contacts may act to preserve and even enhance local patterns of habit, attitude and behavior, and serve as an inhibitor of the process of cultural leveling which is so commonly assumed as an outstanding and unopposed tendency of contemporary life."

It has been impossible to obtain comparable figures, so as to bring this tabulation up to date. It seems quite likely that the trend then commented on, toward a more rapid increase of local contacts than of those which are non-local, has continued. But even if it has, the hypothesis above quoted will still remain—an hypothesis.

The Telephone: A Force both Centripetal and Centrifugal

THIS much seems certain, however, and it is not based on hypothesis alone: The telephone *does* exert a force as a factor in our social life, and that force is sometimes centripetal, sometimes centrifugal. Local telephone conversations with our community neighbors do make us think, if not all alike, at any rate like members of the same community, having common interests. They tend to draw us toward the center of things in the locality in which we live. We are, I think it is safe to say, a little better residents of Montclair, or Pelham or Roslyn or what-you-will because Bell managed to say, "Come here, I want you!" over a wire to Watson some sixty-four years ago.

Toll telephone calls, on the other hand, tend to exert a force that is centrifugal, and, generally speaking, this force is in direct proportion to the length of haul involved in the call. The longer the circuit over which the conversation takes place, the more these telephone talks are likely to take both speakers outside of the rather narrow circle of their own community interests.

A study of the increased average length of haul of Long Lines telephone messages would, if time permitted, prove enlightening and heartening. More and more the telephone is enabling us to extend, in miles, the reach of our contacts with our fellows. Year by year, the length of haul of long distance telephone messages is increasing. The average airline length of haul on long distance telephone calls has gradually increased from about 201 miles in 1928 to about 248 miles in 1938, and, I understand, this trend toward longer and longer hauls is still manifesting itself.

Translated from the terms of statistics to those of social—and, if you will, historical—significance, this means that Americans are not only talking more and more with each other by telephone, but are talking farther and farther. They are extending the circumference of the circle of telephone contacts with each other. They are coming to know each other a little better. And because of these increasing and extending contacts, they are the better citizens of the country in which they live; more useful members of society.

IT would be the worst form of smugness to pretend that we, here in America, have achieved anything like the degree of social or national solidarity that is to be desired. It would be hardly less smug of us, as telephone men and women, to bemuse ourselves into thinking for a moment that the telephone has been the only factor that has helped to bring about such solidarity as we have attained. But we shall be doing ourselves a disservice, and failing to show a proper respect for our high calling, if we do not remind ourselves, now and then, that what we are doing in our daily jobs really *does* matter; that the telephone really does have some social importance; that we are making our bit of American history every time we do the smallest part of whatever our job is; that, in whatever we do, we are helping the telephone to make its mark and set its seal upon the record of the changes in men's relationships that make up human progress.

We shall do well if we make it a point never to forget that we are engaged in providing a service that is, and that we must help to keep, socially and historically significant.

STANDARDIZING BUSINESS PAPERS

Efficiency and Economies in the Purchasing of both Paper and Printing for the Bell System Followed the Organizing of These Important Items of Supply

By JAMES J. MURPHY

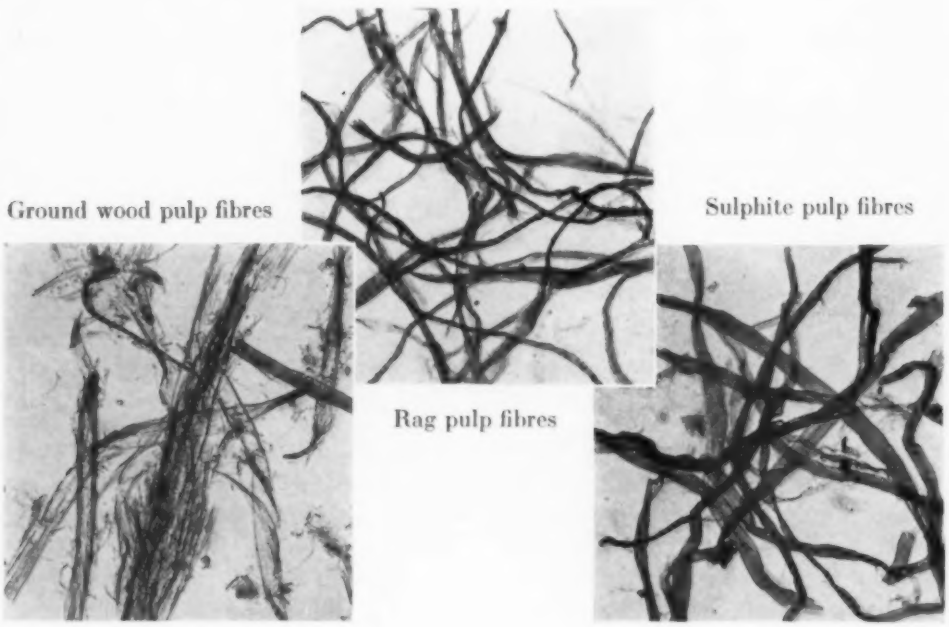
THE birth and development of the telephone directory, and the part played by standardization and centralized purchasing in evolving the books which today serve the users of Bell System telephones, were described in a recent issue of the QUARTERLY.* Standardization and centralized supply arrangements have been applied not only to directories but also to other items of supply which, while less familiar, are nevertheless important in the conduct of the business. Business papers are notable examples.

These are the papers used for records, reports, correspondence, bills, orders, instructions, specifications, checks and the many other purposes for which papers serve as the medium for business transactions. While effort is constantly directed toward reducing paper work to the minimum consistent with orderly operation, Bell System requirements for this class of papers amount to over 5,000,000 pounds annually—equivalent to more than five hundred million letter-size sheets.

So vast a quantity of papers presents many problems in the selection of those best suited to telephone company needs from the great variety commercially available; in the adaptation of those selected to the numerous particular purposes for which papers of this kind are used; and in the establishment of the most advantageous supply arrangements.

The first attempts to meet these problems were begun in 1917. The Western Electric Company, in performing its function of establishing centralized supply arrangements whenever these could be carried out to the best interest of the service, had entered into contracts to centralize the purchasing of the bulk of printed business papers for two of the Associated Companies. While this procedure offered some measure of economy over the general practice of dealing with a number of supply sources and of handling each printed form as an individual transaction, it left much to be desired. The forms required were listed under these early contracts and individually priced according to the judgment of each contractor submitting a bid. The one

* "Directory Paper Purchasing," QUARTERLY, April, 1939.



PHOTOGRAPHS FROM U. S. TESTING CO., INC., HOBOKEN, N. J.

THREE PRINCIPAL PAPER PULP FIBRES

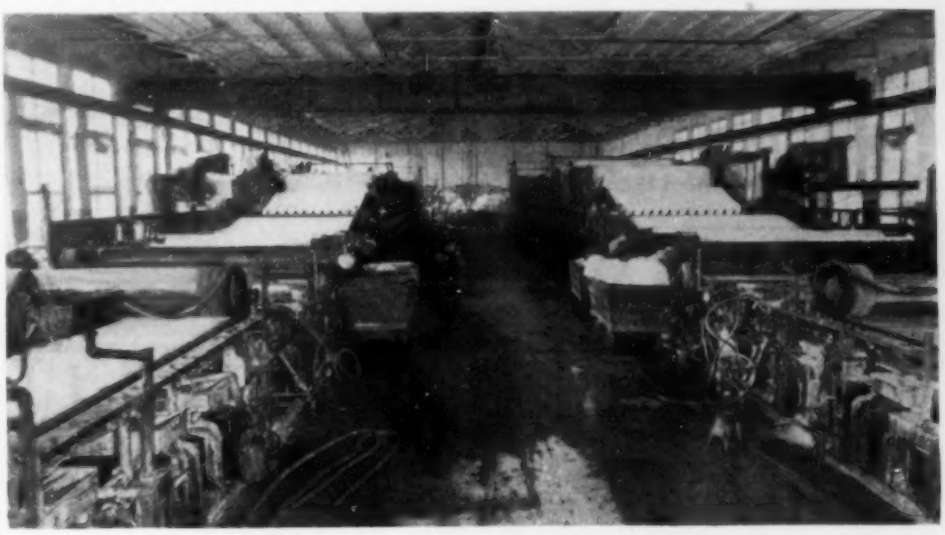
These photomicrographs represent a magnification of approximately 100 diameters

whose total bid was lowest received the business, although for any particular form his price might be higher than other bidders.

In all of these negotiations, paper was a constant source of difficulty. Numerous brands were specified, many of which the printer did not normally carry in stock, and the question of substitution would necessarily arise. Inasmuch as there were hundreds of forms, on papers of many different sizes, weights, and colors, substitution only led to confusion and to the question of whether the substitutions offered by one bidder were the equal in quality of the substitutions offered by another. This difficulty was magnified by the fact that little definite data as to paper quality were generally available.

A further complication developed in the rapid increases in paper prices during the war period. The printer could not control the cost of paper to nearly the same extent to which he could control the cost of his printing and binding, which were under his own supervision. As paper prices went up, the cost of the finished product went up also; and in order to save the contractor from serious losses, price increases were granted which might or might not have been less than a competitor would have asked. The contracts, accordingly, lost much of their advantage.

It was evident that development of a new procedure was necessary. The



FOURDRINIER MACHINES

Paper starts as a thin solution of pulp and water at the "wet" end of these huge affairs, in the foreground, is screened, dried, pressed, and ironed on the way, and reaches the distant end as a finished product

objective would be to establish a range of standard papers of suitable quality for all requirements. These would then be supplied to the printer at definite prices, in order to relieve him of the burden of the paper problem as to both purchasing and quality. Under this plan, the printers, in submitting their bids for a telephone company's business paper requirements, would be concerned only with those elements of cost over which they exercised control.

Enter the A. T. & T. Engineers

THE American Telephone and Telegraph Company was asked to undertake this work, along with its other standardization activities.

At the time the A. T. and T. Company undertook standardization, information for consumer judgment of quality in business papers was indeed meager. Papers were generally sold on a brand basis. Specifications accurately defining strength, wearing qualities, and other characteristics of the types of papers used for business purposes were little used as a basis of purchase.

Testing by consumers was infrequent and, if they wished to make tests, few instruments were to be had. The usual complement of physical testing equipment consisted of the Mullen or "pop" tester, for measuring the bursting strength of paper by breaking a hole through a sheet, a weighing scale, and a micrometer. Buyers would do some "practical" testing by tearing a sheet of paper in several directions, by feeling and rattling it, and even by chewing a small piece. What the last disclosed has not been passed on to us. Experience was the principal guide, and one not in-

frequently upset when a manufacturer elected to change the quality of a particular brand during the course of time or even to discontinue it.

The A. T. and T. engineers decided to establish a range of standard papers adequate for telephone needs, according to basic types. They found that an adequate range was available among the regular commercial grades and concluded that, despite volume sufficient to justify manufacture of special grades, this procedure should be avoided. To ensure that they were fully informed regarding all available grades, they visited paper mills manufacturing qualities varying from the poorest to the best.

Paper and Paper Making

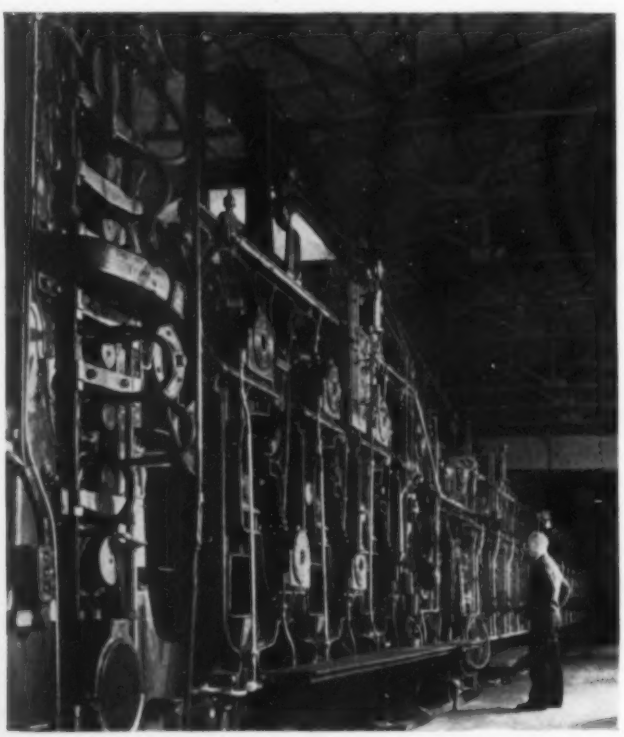
PAPER manufacturing processes are generally similar and, in so far as broad principles are concerned, relatively simple. Paper is basically cellulose fibre, obtained principally from wood and from cotton rags. The wood or rags are reduced to pulp to which a small amount of sizing material is added, consisting of rosin, glue or starch to serve as a binder. Proportions of clay and others fillers are added also to improve opacity and finish. Spruce and pine are the lowest-cost sources of cellulose and are, accordingly, the principal raw material.

For ground wood pulp, which is the major component of newsprint and of many stationers' papers, the wood is debarked, knots are removed, and it is then ground against a stone in the presence of water, to shred the fibres apart. This method of pulp manufacture is the least expensive, but it is also rather drastic and the pulp is weaker and less permanent than that produced by chemical processing, which is employed for the better grades.

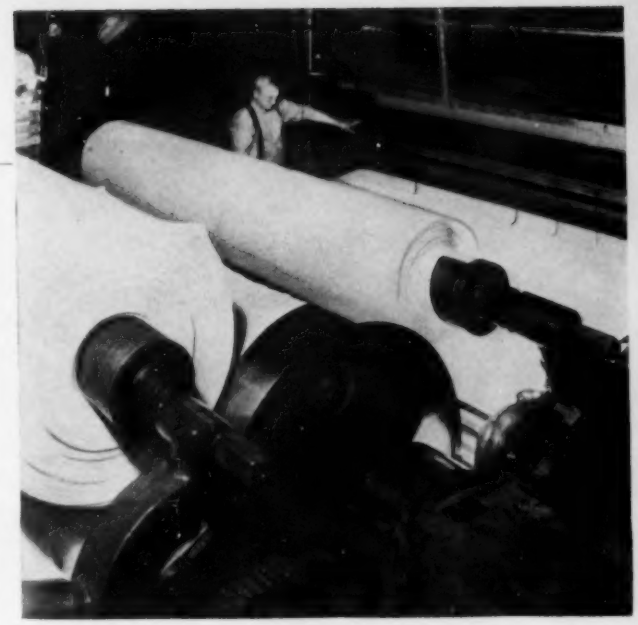
The chemical processes consist of reducing the wood to chips and boiling these for a number of hours with either an acid or alkaline solution, depending upon the characteristics desired in the pulp—to free the fibres by cooking out the resins binding them together. Chemical pulps are bleached to obtain a better white. Bleaching reduces fibre strength to some degree but it also imparts greater permanence by producing a purer cellulose.

When rags are used as raw material, they are cut into small pieces, cooked with alkali and then bleached.

After the pulp is conditioned, it is mixed with great quantities of water and then flows as a thin solution onto the traveling screen of a huge paper-making machine which dries, presses, and irons the pulp before it is transferred to a roll as finished paper.



The "dry" end of a Fourdrinier machine



The final step: winding the finished product on reels

An important and interesting phase of paper making, from the standpoint of paper standardization, is the compounding of pulps to produce papers of various characteristics. Each pulp has qualities that are reflected in the strength, permanence, opacity, etc., of the finished product.

Ground wood or mechanical pulp, as it is also called, is low in cost, has high opacity, limited strength, and limited permanence; qualities which make it suitable for newsprint and for many business purposes when the usage is large and paper of low strength and permanence is satisfactory. A great quantity of paper composed principally of ground wood is employed in the Bell System for tickets to record telephone calls, the consumption exceeding a million and a quarter pounds annually.

Chemical pulps are of three classes: sulphite, sulphate, and soda, the latter manufactured from deciduous woods such as poplar and birch. Papers made from sulphite pulp comprise the great majority of business stationery. It produces a paper of good appearance and wearing qualities at moderate cost. Sulphate pulp makes our brown wrapping paper. It is a stronger fibre than sulphite and is moderate in cost, but because of the brown color its use for business papers is largely confined to envelopes and file folders. Soda pulp is employed only in combination with others. It has little strength but is opaque and finds use where papers having bulk and opacity are required. It is commonly found in combination with sulphite pulp in envelope stocks.

Rag pulp produces papers of the highest grade. They have the greatest strength and resistance to erasure, but are also the most costly. Rag papers are employed for permanent records, ledgers, and other purposes requiring maximum durability and appearance.

The usual combinations of pulps are: ground wood and sulphite; ground wood, sulphite, and soda; sulphite and soda; sulphite and rag. The finished paper bears the characteristic of the pulps of which it is composed in ratio to the proportions used.

Establishing a Standard Range

UPON completion by the A. T. and T. engineers of their review of the manufacturing and technical aspects of the standardization job, the papers in use by the Associated Companies were analyzed for pulp composition, and were tested for strength and other physical characteristics in so far as the limited equipment available at that time permitted. The result of all this work was a thorough acquaintance with both the technology of the available grades of business papers and with the kinds of papers required by the telephone companies.

Combining the technical information, on the one hand, with the usage requirements, on the other, made possible the establishment of a standard range of papers for the Bell System. Originally thirteen grades were set up. They ranged from a low cost paper, composed of ground wood and sulphite pulps, for temporary use forms, to 100 per cent rag papers for permanent record purposes. This list has been revised and expanded during the past 20 years, in pace with the changing requirements of the telephone companies and with the technical developments in papers, until today there are 23 standard grades. The chart on page 146 lists nineteen of the most widely used standards.

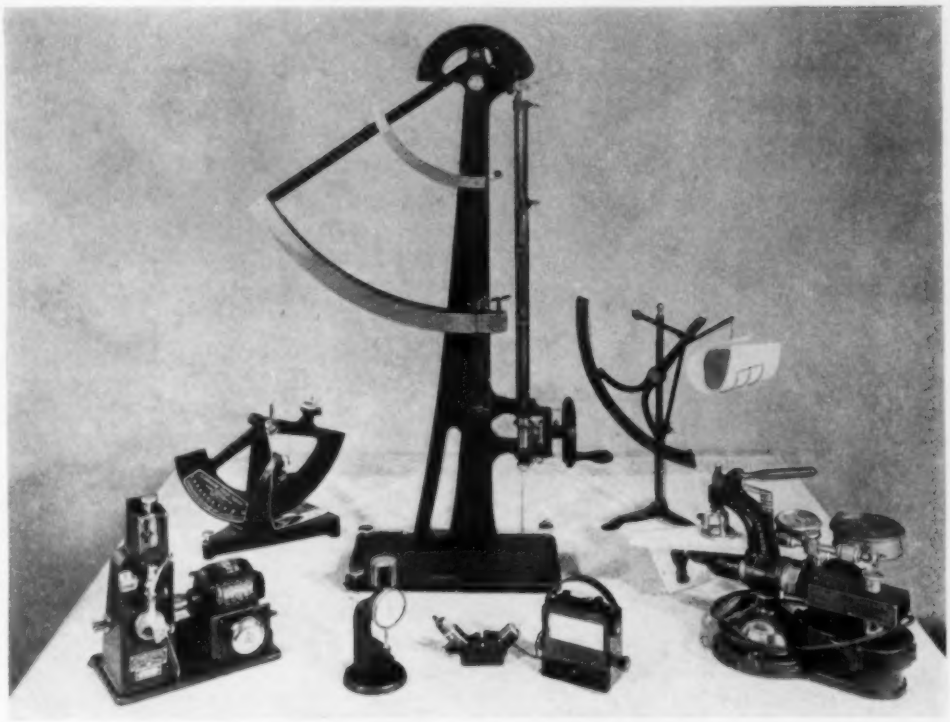
Advances in Technique

WHEN the original thirteen grades were selected, specifications in the form of standard samples were established for each grade. At the time, the standard sample was the nearest approach that could be made to definite specifications, and while data on composition and physical characteristics were developed, it was most practical to buy by sample.

Several conditions contributed to this situation. Raw material and manufacturing control was such that paper made on one day was not necessarily equal in all respects to paper made on the day following, so that considerable tolerance in quality had to be allowed. Paper strength, particularly with respect to tearing and folding, is subject to wide fluctuation with changes of humidity, and a paper that might pass specification requirements on a humid day in summer might fail badly on a cold day in winter when the relative humidity in the laboratory was very low. Air-conditioned laboratories were extremely few at that time, and very expensive. Specifications are normally established on the basis of minimum requirements, but to set them sufficiently low to cover the worst conditions would have resulted in an inadequate definition of grades. The sample basis was accordingly decided on.

Many instruments for the testing of papers have since come into wide use by the paper industry and by independent laboratories, and testing laboratories are conditioned to a definite temperature and humidity. The instruments include devices for measuring opacity, brightness, light reflection, tearing, folding and tensile strengths, smoothness, stiffness, acidity, and degree of permanence. A group of these instruments is shown on the opposite page.

Substantial advances have likewise been made in the technology of paper manufacture and in the design of equipment to control better the processing operations to produce paper of more uniform quality. These developments have recently permitted the preparation of written specifications for the purchase of paper, defining the standard grades in terms of specific test requirements covering composition, strength, opacity, finish, etc. It is no longer necessary for the Western Electric Company, in its purchasing and delivery inspection work, to depend entirely on samples, which may deteriorate in storage to the extent of failing to represent the qualities desired.



PAPER TESTING INSTRUMENTS

Shown here are some of the devices used in establishing and maintaining the desired standards for Bell System business papers

When paper standardization had been completed, the A. T. and T. engineers were ready to assist the Associated Companies in converting their plain and printed papers to the standard grades. The possibilities of effecting economies in printing as well as in paper were developed by the technical men in the course of their investigations regarding qualities of paper necessary for satisfactory printing. These pertained to the many features of form design that contribute to printing economy. Since approximately 75 per cent of all stationery papers used by the Bell System are converted to printed forms, the potentialities for savings on this phase of the work were substantial.

Aiding the Bell Companies

THE telephone companies naturally welcomed expert assistance in the survey of their business papers. All of the many plain papers and all of the hundreds of printed forms required by each company to carry on its business in an orderly manner were systematically reviewed. The standard grades were substituted for papers in current use, with particular attention directed to whether the grade employed was most suitable in each case. If not, a change to another grade was specified.

NAME	SUBSTANCE NUMBER	STRENGTH INDEX	FIBER CONTENT	COLOR	CHARACTERISTIC QUALITIES	USE
LEDGER PAPERS						
TELCO CABLE LEDGER	36	118	100% Rag	Buff	Maximum appearance, permanence, strength, writing and erasive qualities.	Forms where unusual erasive and wearing qualities are essential; such as cable pair record forms.
TELCO CERTUS LEDGER	28	95	100% Rag	White Buff	Maximum appearance, permanence, strength, writing and erasive qualities.	Forms and general ledgers where permanence and exceptional wearing and erasive qualities are important factors.
TELCO GUIDE LEDGER	24 28	46 61	50% Rag Balance Sulphite	White Buff	Fine appearance, very good permanence, strength and erasive qualities, fine writing surface.	Forms and general ledger use requiring a permanent paper with good wearing and erasive qualities. Suitable as the master sheet for gelatin type hectograph duplicators.
BOND PAPERS						
TELCO BLUE PRINT BOND	13	57	100% Rag	White	Maximum appearance, permanence, strength and erasive qualities. High degree of transparency.	Forms requiring high and uniform transparency in order that blueprint copies may be made of records prepared with typewriter or pen.
BELL SEAL BOND	13 16 20	57 68 84	100% Rag	White	Maximum appearance, permanence, strength and erasive qualities. Cockle finish.	Letterheads and printed forms requiring maximum permanence and wearing qualities.
BELL SEAL "A" BOND	13 16 20	34 42 57	75% Rag Balance Sulphite	White	Maximum appearance, high degree of permanence, strength and erasive qualities. Cockle finish.	Letterheads and printed forms requiring a high degree of permanence and wearing qualities.
TELCO FAVOR BOND	13 16 20	29 37 47	50% Rag Balance Sulphite	White Blue Canary Green Pink Goldenrod	Fine appearance, good permanence, very good strength, and erasive qualities. Light cockle finish.	More general work than the Bell Seal Bond grades where a permanent paper having good wearing and erasive qualities is required.
TELCO MESSAGE BOND	13 16 20	21 27 35	100% Sulphite	White Blue Canary Green Pink Goldenrod	Good appearance and strength. Limited permanence and erasive qualities.	Very general use where permanence, wearing and erasive qualities are not of great importance.
TELCOPAQUE BOND	13	18	100% Sulphite	White	Good appearance, maximum thickness and opacity. Limited strength and permanence.	Two-sided printing work where minimum bulk is essential.
TELCO MANILA	16 20	25 32	50% Ground Wood Balance Sulphite	Manila	Fair appearance, limited strength, fair writing surface, suitable for pencil erasure. For temporary records only.	Very general use on temporary forms and as a typewriter paper where appearance and permanence are not essential.
WRITING PAPERS						
TELCO WRITING	16 20 24	23 32 38	100% Sulphite	White	Good appearance, strength, and writing surface. Limited permanence and erasive qualities.	Telephone bills and forms requiring a smooth pen writing surface where permanence, wearing and erasive qualities are not of great importance.
MANIFOLD PAPERS						
X BOND	9	24	100% Rag	White Canary Green	Maximum appearance, permanence, strength, and erasive qualities. Heavy cockle finish.	Manifolding purposes requiring permanency and general service qualities.
BELL MANIFOLD	7	16	100% Rag	White	Maximum thinness and permanence. Good appearance, strength, and erasive qualities on carbon copies. Glazed finish.	Extreme manifolding purposes where maximum thinness is required.
TELCO CHROMIUM	8	12	100% Sulphite	White Blue Pink	Good appearance. High degree of thinness. Limited strength, permanence and erasive qualities.	General manifolding requirements where permanence, wearing and erasive qualities are not of great importance.
DUPLICATOR PAPERS						
BELL MIMEOGRAPH	16 20 24	32 41 53	75% Rag Balance Sulphite	White	High degree of permanence and strength. Good appearance. Fair pen writing surface.	Mimeograph work where a high degree of permanence is required.
TELCO MIMEOGRAPH	16 20 24	27 35 46	100% Sulphite	White Canary Green Pink Goldenrod	Good appearance and strength. Limited permanence. Fair pen writing surface.	General mimeograph work where permanence is not of great importance.
TELCO HECTOGRAPH	20	24	100% Sulphite	White Buff Green Salmon	Good appearance. Limited strength and permanence. Coated one side to provide maximum smoothness. Fair writing surface.	General use in making copies on gelatin process hectograph duplicators.
SAFETY PAPERS						
TELCO SAFETY PAPER	24	45	100% Sulphite	Buff Green Pink Primrose Stone	Safety surface design. Good writing surface and strength. Limited permanence.	Official company checks and other forms requiring safety protection.
TELCO SAFETY PAPER SPECIAL GRADE	24	57	50% Rag Balance Sulphite	Buff Green Pink Primrose Stone	Safety surface design. Good writing surface and permanence. Very good strength.	Official company checks and other forms requiring safety protection where permanence is a factor.

Substance Number is the weight in pounds of 500 17" x 22" sheets.
Strength Index is the average of the bursting and tearing strengths.
Colors listed available in each weight.

SYSTEM STANDARD

Chart of the 19 standardized grades of business papers most used in the Bell System

Forms or plain papers that did not cut economically from standard ream-size sheets were changed, as far as practical, to sizes that would. There are a number of mill standard ream sizes for business papers, the most common being 22 x 34 inches. Eight letter-size sheets 8½ x 11 inches will cut exactly from this standard size; but if the plain paper or form were 9¾ x 12½ inches, only four could be cut from the mill size. The remainder is waste which must be included in the price of the finished product.

Odd sizes in forms often come about because they are designed from the inside out rather than the outside in; that is, the designer will draw the form and let over-all dimensions come as they will, rather than first approximating the size, selecting the nearest multiple of a standard ream size, and then designing the form within it. From the attention to size, not only more economical but also more practical and better looking forms have resulted.

THE use of colored papers to designate the second, third or fourth copies of forms and for other purposes was minimized in the surveys because, if used too widely, colors lose their significance: pink may have a certain significance with respect to one form but quite a different meaning in the case of another. Colors also add to the cost; for example, a form made up of four copies, each of a distinguishing color, involves extra expense for printing, since each must be run separately and then collated into sets.

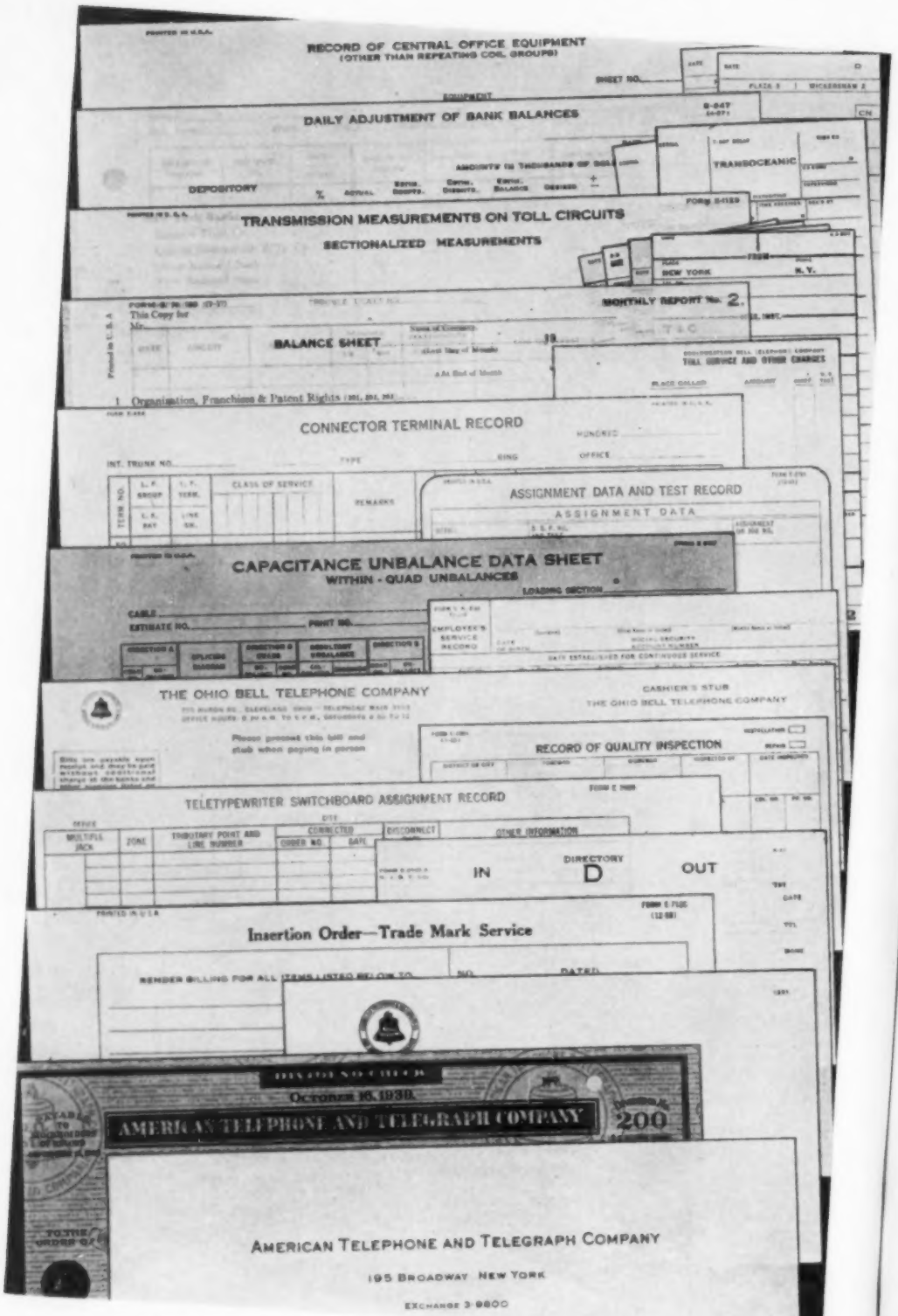
It was sometimes found that separate copies of forms bore minor differences in printing. As far as the printer was concerned, each copy represented a different job, and the important factor of quantity in printing economy was diminished by these minor differences. Other items contributing to extra expense of forms were eliminated as far as practical, such as two color printing, printing on both sides of a sheet, numbering, perforating, and others.

Centralized Purchasing

As each form was reviewed, specifications were established to cover the usage, size, grade of standard paper, color of ink, punching, binding, etc. With this information set up, the ground work was laid for the Western Electric Company to take up again its plan for centralized buying of business papers in the performance of its function as the service of supply for the Bell System.

Coincident with the surveys of each company's business papers, the Western Electric Company had set up supply arrangements for the standard paper grades. These permitted it to furnish the printers with papers of certain standards of quality at definite prices. The printers were thus relieved of responsibility for both paper cost and quality, which had been primary obstacles in the earlier attempts at establishing satisfactory central supply arrangements.

As each survey was completed and specifications were drawn up for all stationery forms, the Western Electric Company buyer stepped into the picture to negotiate with the printers. One of the first questions presented was the handling of the composition for each form. Setting a form in type,



SOME TYPICAL SYSTEM BUSINESS PAPERS

These and hundreds of others are printed on stocks and to specifications described in the accompanying article

or ruling it in wax in order to make an electrotype plate for printing the form, is a basic expense which applies regardless of the number of copies to be printed. With the hundreds of forms involved, the total cost for composition represents a substantial sum.

In order to protect this investment, it was decided to produce a master plate, for a small additional cost, which was set aside as the telephone company's property. The printer was permitted to prepare his printing plates from the master and to use it for replacing plates that became worn or damaged. Telephone company ownership of the master plates also facilitated competition in arranging contracts, for otherwise a new printer would have to reset all composition in order to make printing plates for his own presses—a handicap that would practically preclude a successful bid.

Establishing Authorized Stocks

It will be recalled that, in making up specifications for each form, usage was included. In the case of forms having a continuing demand—the great majority—this represented annual usage. Based upon this figure, definite stocks were determined upon, which the printer was authorized to establish and maintain during the life of his contract. These were called authorized stocks. They were intended to assure prompt service to the telephone company and to give the printer the equivalent of standing orders which he could use in arranging manufacturing schedules for most economical production.

Since the authorized stocks established the manufacturing quantities, they also established the quantity upon which the price of each form was based. The stocks were normally set to last three to four months, although for forms of limited use, where the small quantity might involve excessive printing costs, the stocks were for longer periods. The authorized stocks permitted the printer to level his production, and to keep his organization busy replenishing the telephone company's withdrawals at times when his business from other sources was slack. The stocks were drawn on by the telephone company as required.

The plan of having standard papers, specifications for each form, master plates, and authorized stocks, met with considerable favor among printers. Opportunities were afforded for savings in manufacture which were reflected in the bids submitted by the printers to the Western Electric Company's buyer, and very substantial reductions in the cost of business papers to the telephone companies resulted.

Purchase arrangements have undergone simplification over the years, until today printing for Bell System business papers is purchased literally on a square-inch basis. The specifications continue to be used, a little more inclusive perhaps, but essentially the same, including a price for each individual form.

The price for printing each form, however, is based on its square-inch area. In submitting bids, the printer establishes his printing prices, or press

work schedule as it is called in the trade, in tabular arrangement according to square-inch area and quantity to be printed. The table shows that a form of 100 square inches in 5000 quantity costs one price, in 10,000 quantity another, etc. Composition and electrotype plate charges are also set at flat rates per square inch. Paper is priced on a pound basis, as formerly, according to the maximum number of cuts obtained from standard size sheets.

DEFINITE scales of prices are established for other operations, including padding, collating, punching, binding, etc. This procedure greatly simplifies pricing of existing forms and permits immediate pricing of most new ones. It eliminates entirely the tedious task under the old contracts of pricing each form individually, or at the same figure as another of the same size, quantity, style, and paper quality. Lithographic or offset printing has also come into general use as a supplement to type printing, especially for the reproduction of statistical charts and of material prepared by typewriter.

The plan for simplifying paper requirements by standardizing an adequate range of grades, for the elimination of costly and frequently nonessential printing operations, and for centralized supply arrangements has resulted in a very material reduction in the cost of business papers to the Bell System—cost representing an annual expense of several million dollars.

Formerly, the hundreds of forms used constituted hundreds of separate problems and purchase transactions for each telephone company. Today the problem has been reduced to the review of a chart for paper selection and to the review of specific instructions for the economical design of forms from a printing standpoint. The Western Electric Company has reduced purchasing to the arrangement of a contract covering a period of one year or more for each company.

In addition to the very substantial monetary savings, there is the assurance that the paper grades used are those best suited to the requirements, and, equally noteworthy, there is an immense saving of time through this more efficient and orderly procedure for seller, buyer, and consumer.

MUCH has been accomplished. It would appear that another story of what coöperation and the persistent pursuit of a clear-cut objective can accomplish is ended. But not so; for continued study is made of possible changes in the plans described, to effect further simplification and economy. As improvements are brought about, they have served as the vantage point from which to look beyond present horizons to future opportunities for progress through the coöperative effort of all concerned.

FOR THE RECORD

LEWIS H. BROWN ELECTED A DIRECTOR

At the meeting of the Board of Directors of the A. T. and T. Company on February 21, Lewis H. Brown, president of the Johns-Manville Corporation, was elected a director, to fill the vacancy caused by the death of Philip Stockton. Mr. Stockton, who died on February 11, had been a director since 1914. Mr. Brown, who was elected to the Johns-Manville presidency in 1929, has served on many committees interested in civic and national affairs, and was for several years a director of the New York Telephone Company.

REDUCTIONS IN CERTAIN LONG DISTANCE RATES

Reductions in Long Lines Department rates to points in this country more than 420 miles distant, which will become effective May 1, will save the public an estimated $5,300,000 annually. These reductions were the result of negotiations with the Federal Communications Commission, which had instituted an inquiry as to possible reductions in long distance telephone rates. The following examples are typical:

	Initial Three-Minute Period							
	Station-to-Station				Person-to-Person			
	Day		Night and Sunday		Day		Night and Sunday	
	Present Rate	New Rate	Present Rate	New Rate	Present Rate	New Rate	Present Rate	New Rate
Chicago-Washington	$1.85	$1.65	$1.15	$1.10	$2.45	$2.20	$1.75	$1.65
Boston-Chicago	2.50	2.10	1.50	1.40	3.25	2.80	2.25	2.10
Oklahoma City-New York	3.75	2.90	2.25	1.95	4.75	3.85	3.25	2.90
Chicago-Los Angeles	4.75	3.50	3.25	2.50	6.25	4.50	4.75	3.50
New York-San Francisco	6.50	4.00	4.25	3.00	8.75	5.00	6.50	4.00

DEMONSTRATION OF STEREOPHONIC REPRODUCTION OF MUSIC

The stereophonic reproduction of "enhanced" music was demonstrated to distinguished audiences in Carnegie Hall, New York City, on April 9 and 10 by the Bell Telephone Laboratories. There for the first time was shown the possibility of recording and reproducing every sound of a program which the ear could have heard at the original performance.

Listeners had the same spatial sense of the source of the music as if they had been present in the hall at the time of recording and, in addition, heard the music enhanced according to the original director's interpretation of tone and volume.

This accomplishment is the culmination of a long series of researches by the Laboratories. As long ago as 1933 a symphony concert produced in Philadelphia was transmitted over telephone wires to Washington and there reproduced stereophonically before the National Academy of Sciences. Subsequent research has supplied the equipment and technique for recording music without loss and with an actual enhancement of its artistic feeling.

With the coöperation of Leopold Stokowski and the Philadelphia Orchestra, of the Tabernacle Choir and organists in Salt Lake City, and of Paul Robeson and other artists, scientists of the Bell Telephone Laboratories under the direction of Dr. Harvey Fletcher first recorded their music or drama either in Philadelphia or in Salt Lake City. At a later audition the artist or director was able to vary the recorded volume and to change the tonal color of the music to suit his taste. At will, he could soften it to the faintest pianissimo or amplify it to a volume ten times that of any orchestra without at all altering its tone quality, or he might choose to augment or reduce the high or low pitches independently. While he was thus enhancing the music which he had himself produced, his interpretation was being re-recorded on film as a permanent record. Records so produced were played at Carnegie Hall.

The technique worked out by Dr. Fletcher and his associates picks up the original sounds through three microphones, placed respectively at right, center, and left of the stage. Sound currents from each microphone are amplified, and are recorded on separate sound tracks on a moving film.

Since an orchestra or an organ has a range of loudness very much greater than can be recorded without distortion on a photographic film, it is necessary to "compress" the original range of sounds before recording. On a fourth track, account is kept of the amount of compression, as an automatic control for the "expansion" of volume range which must be made in reproduction.

When the film is run through the reproducer, three separate sound currents are created. Each sound current actuates its own set of loud speakers, located at right, center and left of the stage. This arrangement, together with the wide frequency and volume range of the system, gives to the music spatial and emotional values heretofore unknown either in reproduced or original productions.

From the choral numbers, vocal solos, organ, drama, and grand opera reproduced in Carnegie Hall, the audience gained an idea of the versatility of the stereophonic system. This first part of the program was climaxed by the closing scene from "Götterdämmerung." For its fortissimo passages, Dr. Stokowski took full advantage of the tenfold increase of sound over that of the largest orchestra, and used effectively the individual controls to make the soloist's voice clearly heard above the orchestra. That number, and orchestral works by Bach, Debussy, Strauss and Moussorgsky which formed the second part of the program, were played by the Philadelphia Orchestra under Dr. Stokowski's baton. In his enhancements, he has shown a grasp of the possibilities of the stereophonic system which comes from his long association with it and from his interest in this development of the musical art.

CONTRIBUTORS TO THIS ISSUE

GRADUATED from Dartmouth College with the B.A. degree in 1909, HAROLD M. PRESCOTT entered the Bell System two years later as a traffic student with the Pacific Telephone and Telegraph Company at Los Angeles. He was engaged in traffic work on the Pacific Coast for 17 years; from 1919 to 1925 he was General Toll Supervisor, and Division Traffic Manager from 1925 to 1928. In the latter year he transferred to the A. T. and T. Company as head of the central office results group in the Department of Operation and Engineering. In 1929 he became Traffic Results Engineer, and on January 1 of this year was appointed Traffic Engineer. The development of a more personal and pleasing service, through such means as are described in his article, has been one of his special interests for a number of years.

BATES COLLEGE graduated ROBERT L. TOMBLEN with the degree of B.A. in 1914, and Worcester Polytechnic Institute with the degree of B.S. in E.E. in 1917. He joined the Long Lines Department of the A. T. and T. Company in July of the latter year as a student in traffic engineering, but left for military service in September. After 19 months of army duty in this country and overseas he rejoined the A. T. and T. Company in the Commercial Engineer's Division of the Department of Operation and Engineering. Here he was engaged for several years in making commercial surveys of some of the principal cities of the country. In 1929 he transferred to the Chief Statistician's Division of the Comptroller's Department, where he continued his market research and population studies. He is a member of the Population Association of America, and has contributed to the QUARTERLY several articles which analyzed the 1930 census data and related subjects.

RECEIVING the B.A. degree from Lafayette College in 1907, and the LL.B. degree from the New York Law School in 1909, ROBERTSON T. BARRETT practiced law until 1918, and for the next three years was engaged in newspaper work. In 1921 he joined the Information Department of the A. T. and T. Company, and since 1936 he has combined his duties in that department with those of Historical Librarian of the A. T. & T. Co. He is editor of the *Telephone Almanac*, and has contributed articles on a variety of topics to the QUARTERLY.

FOLLOWING his graduation from the Sheffield Scientific School of Yale University in 1920 with the degree of Ph.B. in M.E., and a short period in another industry, JAMES J. MURPHY joined the A. T. and T. Company in the Department of Operation and Engineering in 1921. His work has included the standardization of numerous office supply items required in the telephone industry, of which his article on business papers is representative. In 1936 he was appointed supply specialist in the Plant Operation Division of the O. and E. Department, and is in charge of the group engaged on office and building supply standardization and on building operation matters.